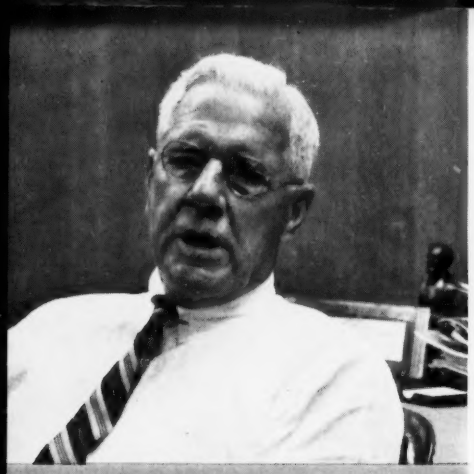

Lincoln Electric's James F. Lincoln . . .

says: "We need greater confidence . . .

fewer tests, to cut arcweld costs . . .

Controversy about the role of nondestructive testing in welding is getting more intense. Many claim they need immediate relief to maintain growth of the joining process in areas like structurals .....Page 84.

JULY 20, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

What Steel Labor Developments Mean To Workers, Consumers, Economy

Steelmaker Offers Application Aid

Press Order Rate Turns up Again

SUB: What Labor, Management Want

Ohio Valley to Be Midwest's Ruhr?

Special Machine Knowhow Aids Builder on Reactor Job

COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 39

How B&W JOB-MATCHED TUBING helps you engineer-for-profit

You can count on B&W Tubing to help reduce costs and make a better product because from B&W you can get:

- . . . a choice of either seamless or welded types to meet your job requirements economically.
- . . . standard or special specifications to help simplify fabrication.
- . . . engineering help in your selection of the *one* tubular product best suited to your needs.

These are just a few of the reasons why it pays to specify B&W Job-Matched Tubing. Call your local B&W District Sales Specialist, or write for Bulletin TB-361 for full details. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

TA-9029 G5

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

This Week in STEEL

The Metalworking Weekly

July 20, 1959 Vol. 145—No. 3

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Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED JULY 11	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	165†	158	174	126

†Preliminary.

The drop in steel production, plus a decline in freight carloadings during the coal miners' holiday, caused STEEL's industrial production index to dip below the pre-Fourth of July level. There is little chance of a pickup before fall.

Details on Page 69

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JULY 18	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	126,000* *Estimated.	125,996† †Preliminary.	129,270	85,533

June sales of cars were the best since September, 1955, bolstering production schedules in autodom. Shutdowns for model changeover have started, but output is still only slightly below the best levels of the year.

Details on Page 66

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JULY 19	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	849*	2,252	2,620	1,481
Index (1947-49=100)	52.9*	140.2	163.1	92.2
Percentage of capacity	30*	79.5	92.5	54.9

*Estimated by STEEL; comparative figures reported by AISI.

Failure of industry and labor negotiators to reach an agreement on a new contract resulted in a sharp drop in production. Only 56 producers, accounting for 13 per cent of total capacity, continue normal operations.

Details on Pages 121 *and* 128

STEEL SCRAP PRICE COMPOSITE

	JULY 15	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$38.67	$38.00	$36.50	$36.67

STEEL's composite on No. 1 heavy melting steel scrap advanced 67 cents last week in the face of a sharp curtailment in consumption. Market strength is due to heavy demand for export tonnages on the Eastern Seaboard.

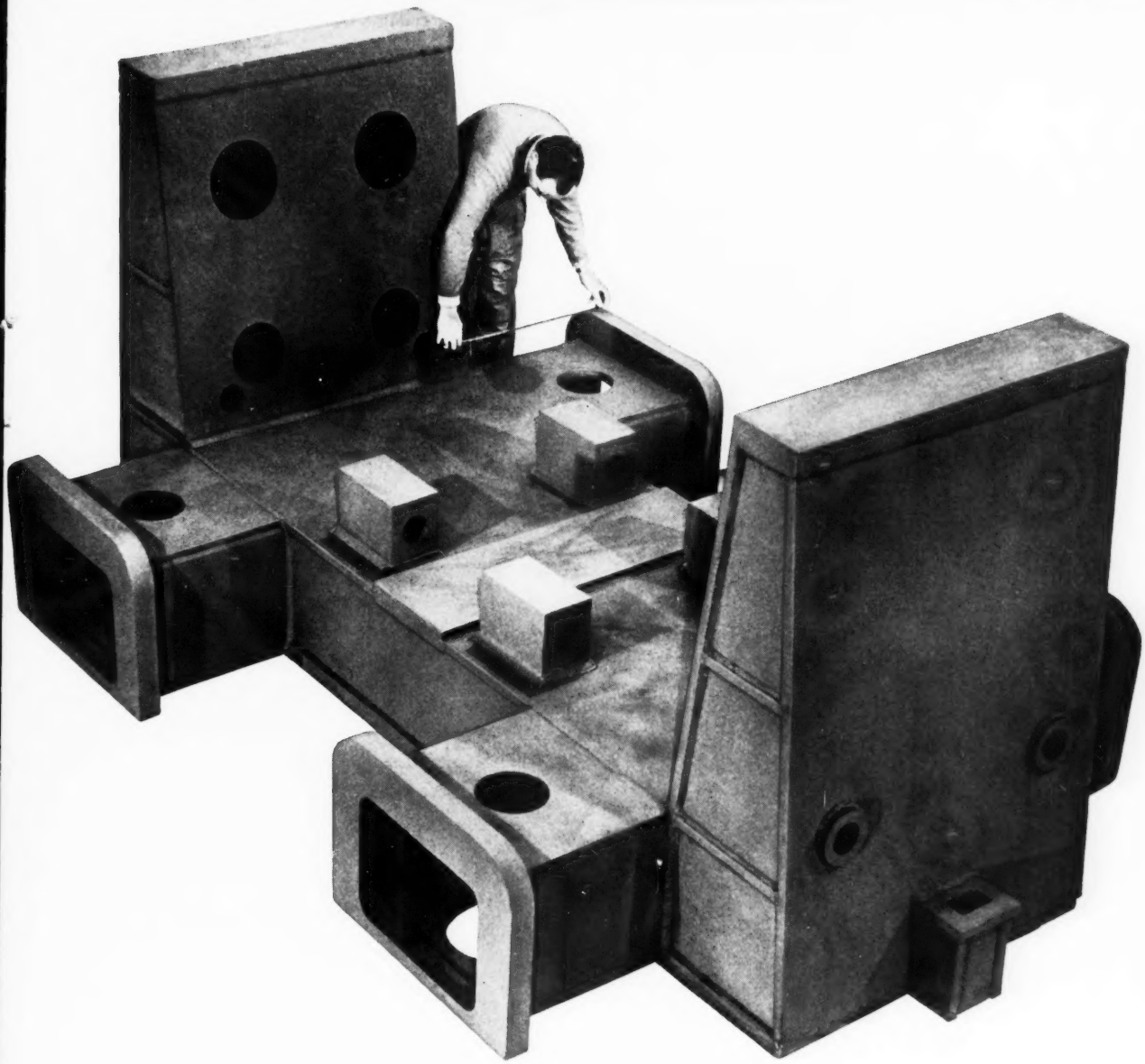
Details on Page 141

FINISHED STEEL PRICE INDEX

	JULY 14	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.5

Activity in the steel market pricewise is confined to the export segment. European mills are running behind on commitments and have advanced their quotations on bars, shapes, plates, and most wire items.

Details on Page 129



16,000 lb Press Base

FABRICATED FROM BETHLEHEM PLATE

This fabricated extrusion press base measures 93 in. by 154 in., and is 65 in. high. Made in the plant of CPC Engineering Corp., Sturbridge, Mass., the press base is made up of Bethlehem plates ranging in gage from $1\frac{1}{4}$ to $6\frac{3}{4}$ in.

Bethlehem plates are ideal for weldments because of their uniform quality. When you use Bethlehem plates, together with good welding technique, you can count on sound welds.

Bethlehem plates are available in a full range of sheared and universal mill sizes. Our nearest sales office will gladly give you complete details. If you'd like our new catalog on plates for your reference shelf, just write us at Bethlehem, Pa.

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Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

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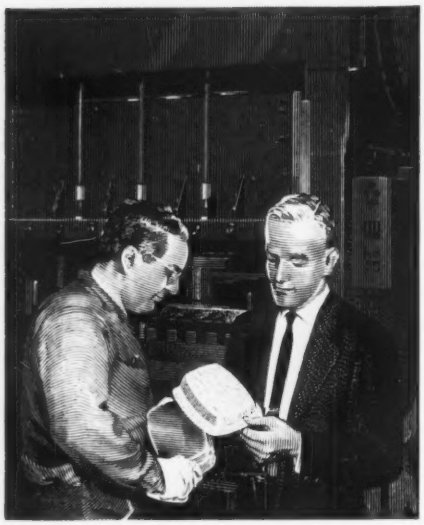
To the Executive concerned with
the Cost of Retooling for Vinyl-Clad Metals...

Why shouldn't you fabricate CLAD-REX on existing tooling ...many others do!

Hard to believe, perhaps, but it's true. No exotic technique *or* complicated special tooling is needed to make your product with Clad-Rex vinyl-metal laminate. Because Clad-Rex can be fabricated in almost as many ways as any *un*finished



sheet metal. And, what's more, Clad-Rex offers, *without charge*, a Field Fabricating Engineer. He shows your shop people how easy it is to get into production.

There are two basic reasons why Clad-Rex vinyl-metal laminates are so practical:

1. Clad-Rex, unlike some other vinyl-clad metals, is a calendered, semi-rigid, poly-vinyl chloride film laminated to sheet metal.

That simply means Clad-Rex has unusual resistance to abrasion. Actually, Taber Abrader Tests (ASTM Standards) prove Clad-Rex is four times as rugged as linoleum floor tile.

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1-A

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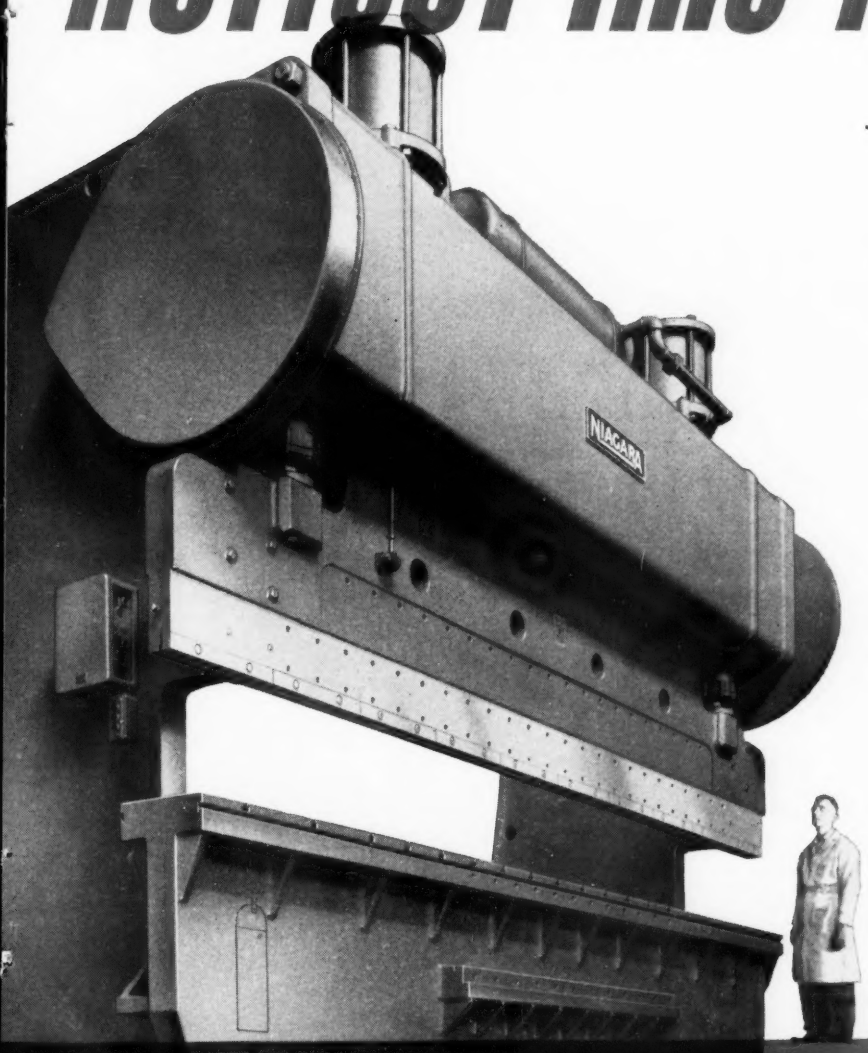
hottest line in '59



...way out front in production-boosting, cost-cutting features... highest dollar value of all

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ENTER THE **GOODYEAR DISTRIBUTOR** AND—

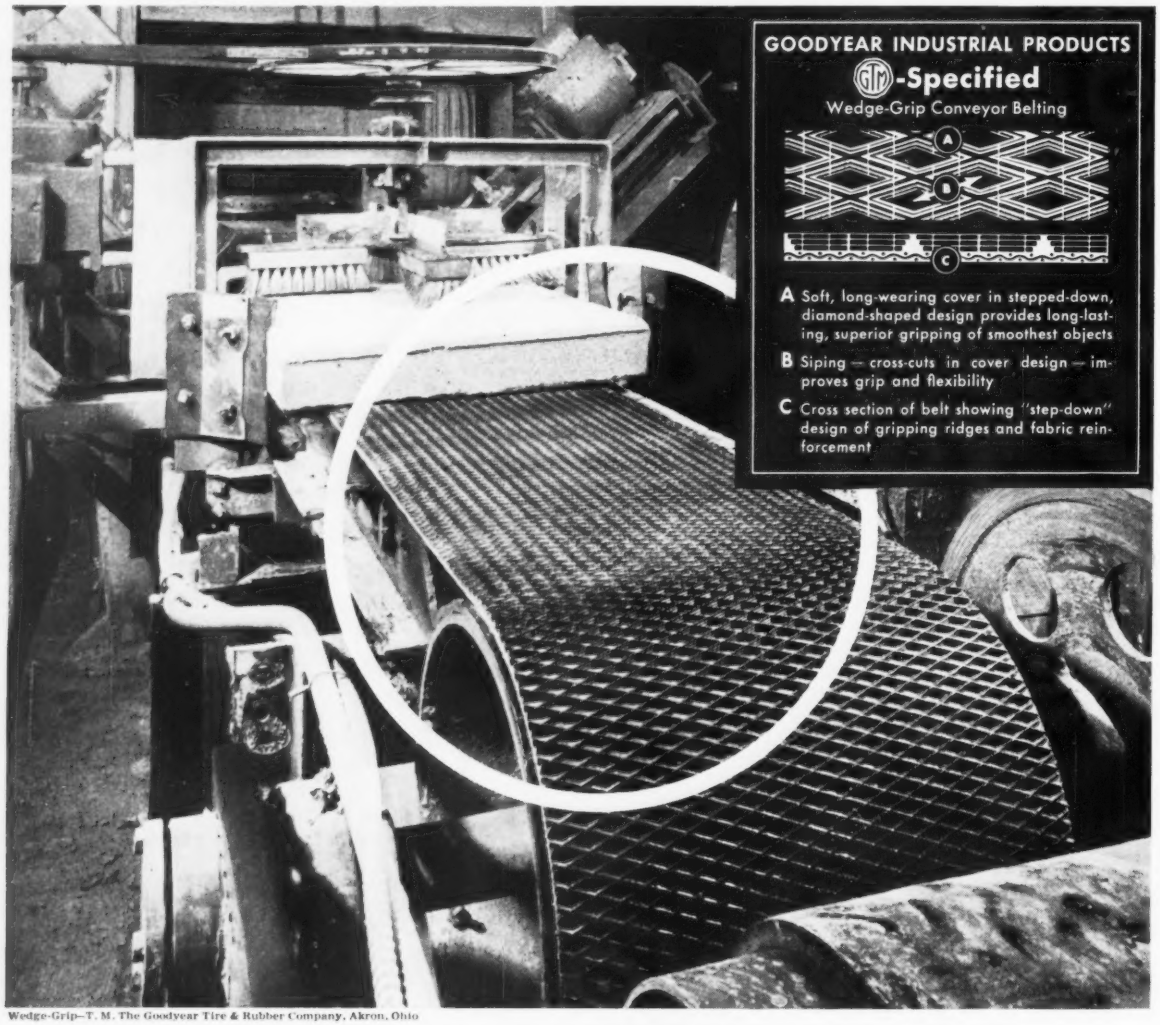
$10 to $30 a day no longer slips away

The sizing machine was a profit-eater at this big Southeastern tilemaker's. For no matter what type feeder belt they tried, the oil-slick tiles would slip and slide. That meant some tiles stayed under the sizing wheel too long – sending $10 to $30 worth to the scrap heap every day.

Then their Goodyear Distributor learned of the problem. He consulted with the G.T.M. – Goodyear Technical Man – then recommended a special oil-resistant version of the famed Wedge-Grip belting.

And the result? The soft, flexible Wedge-Grip cover– in its unique, stepped-down, cross-cut design – keeps a firm grip on those slippery tiles at all times. That virtually ended the rejects. *So the Wedge-Grip paid for itself in the first month of use* – and its deep-etched design won't wear smooth for years.

That's typical of the problem-solving suggestions you get–together with the top-quality industrial rubber products to make them pay off–when you check with your Goodyear Distributor and the G.T.M. You'll find his name under "Rubber Products" or "Rubber Goods" in the Yellow Pages of your phone book. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.


GOODYEAR INDUSTRIAL PRODUCTS
GTM-Specified
Wedge-Grip Conveyor Belting
A
B
C
A Soft, long-wearing cover in stepped-down, diamond-shaped design provides long-lasting, superior gripping of smoothest objects
B Siping – cross-cuts in cover design – improves grip and flexibility
C Cross section of belt showing "step-down" design of gripping ridges and fabric reinforcement

Wedge-Grip–T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

STEEL
Servicenter

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

July 20, 1959

We Proudly Introduce . . .

STEEL's Honorary Editor No. 1

He's Robert C. Wellman, president, Wellman Co., Cleveland. Handing him his certifying card is Editor Wait Campbell (right).

Six judges selected the winning title, STEEL **Servicenter**, from 704 suggestions sent in by readers. It was a monumental task. The 704 were screened down to 70, then seven, and finally it took a preferential ballot.

During the sifting, comments like: "Think of what beauty contest judges go through," filled the air.

What's in a Name?

In selecting a name, the judges looked for one which would appropriately describe the department's function: To serve readers. We think Servicenter does the job. Our services to you are nearly infinite. We're offering you a place to air your problems, voice complaints, interpret trends and events, or indulge in do-it-yourself editorializing. We provide a question and answer service and draw upon the knowledge of the entire editorial staff to find the information you need. We also provide access to STEEL's Research Department.

Before the contest, the editors had called the department Reader Service Center, so the new name reflects what we hoped the department would be. And, too, as we mentioned in our first column, Ed Service (that's us) is the editor who heads up this department.

For the record, plenty of entries specified Reader Service Center, Service Center, Service Centre, Service Sentor, and so forth, but only Honorary Editor Wellman spelled it Servicenter.

We've long suspected that our readers were a creative, responsive group. This contest confirmed our suspicions. Here are some titles suggested by you, the readers: The Melting Pot, Steel Yourself, and Sound Off had 15 advocates. The Sounding Board, Steel Filings, and The Open Hearth had nearly as many. Quite a few entrants suggested that the Open Hearth should be used with a picture of men seated before a fireplace, in a home or clubroom, to connote warmth and friendliness.

Random Samplings

There were nonending take-offs on Readers' Writings and various forms of Talk as in Back Talk, The Readers Talk, and STEEL-Talk. Chips & Quips came in for some votes as did The Anvil Chorus, Reverberations, At Your Service, and the Slag Heap, Pit, and Pile.

Among the plays on words: Forum & Againstum, Mettle Working, Readers Ink., Steeliloquy, Steeling A Minute, Steelettos, Retort, Service-by-Service, Mentallurgy, Reader Radar (screening your views), The Scarfing Corner, The Ferrous Wheel, Metalwording, and Letter-torial Dept.

By Category . . .

Many were identified by type—the light touch: Yes, and Again, No; the literary: Cabbages and Kings and In the Wake of Tubal Cain; the religious: The Amen Corner; the esoteric: Ambrosia Inc.; the cynical: Whew! The People!; the psychological: Brain Boundary; the scholarly: *Quod Erat Demonstrandum;* the culinary: Potpourri and Succotash; the space age: Outer Space and Readers' Orbit; the medical: Ulcer Corner; the clandestine: Rendezvous; the anatomical: The Steel Ear (it withstands heat); the nautical: Foghorn Corner; the cordial: Service, With A Smile; the equine: Dope Sheet; and perhaps the wildest: Maudlin Metaldom.

How About This One?

One more name which deserves mention—really all of them do, but there isn't room—it's Onery Ed's Corner. That name is about as far as you can get from our concept of this department's function, but it has a ring of truth.

Sometimes we do get "onery" especially when that new fangled humidity-temperature index hovers in the 70s. You'll see us in cycles, ups and downs, sometimes as Service, with a smile, and at other times as "onery" Ed. Right now we're up, and we thank the 580 readers who supplied

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PERFORATED
METAL
MEANS
PERFECT
SCREENS
Specially
Fabricated for
ALL INDUSTRIES
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JERSEY CITY 4, N. J.
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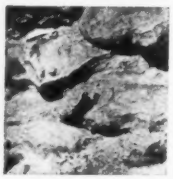
us with their choices. You gave us one of the toughest, yet one of the most pleasant jobs, we've ever had.

We couldn't let this subject go without mentioning some of the rare postage affixed to entries. One post card arrived here bearing $1.43 in postage, and another, the king of all time, was clicked out of a postage metering machine with a value of $4.65. We know that the U. S. Postal Service has money problems and that people were anxious to get their entries in before the June 23 deadline, but that $4.65 was enough to send seven registered post cards to the Belgian Congo.

Better check your meters, men. Something's afoul in the mailroom.

What Is It?



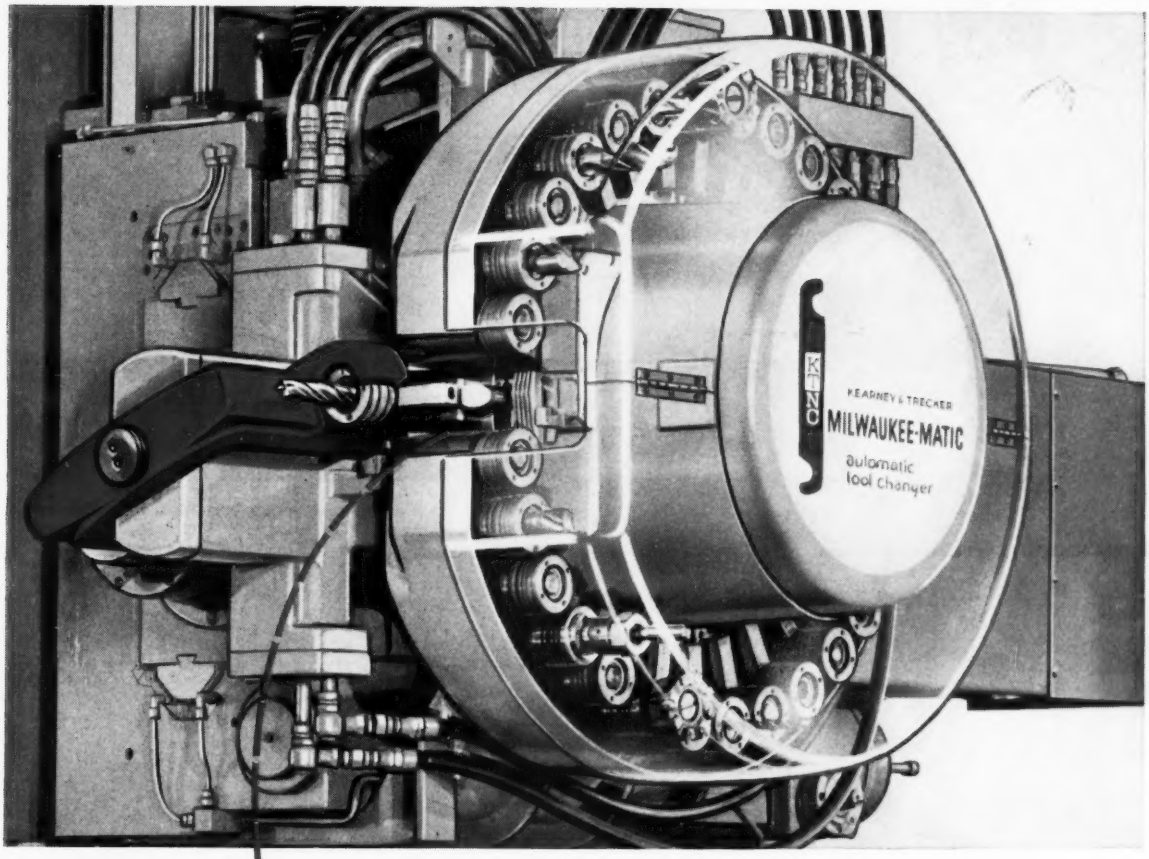
This puzzling hunk of art aroused all kinds of speculation in STEEL's offices. One of our art editors, Tom Welsh, flashed the photo in front of many people and asked their reactions. "Mud flow on the delta of the Ganges River," noted one world traveler. A looker-on laconically commented: "Colorado River on a rampage." Another imagined it was molten lava coursing down the side of Mexico's Popocatepetl. A nongeography speculator said, hungrily: "It's pecan fudge." If you want the identification turn to Page 84.

Focus on Unions

This fellow is taking the long look at four of the big unions in metalworking. There's evidence that we're entering a new era in union-management relations. Companies are tired of the year in, year out wage spiral. Unions have been living on government support, public apathy, or plain power which has enabled them to get more money and benefits for members.

Now management has toughened up (General Electric Co., for example, has been a particularly tough bargainer, saying we'll give so much and no more—steel company negotiators are also plugging the well of largess); government officials have changed attitudes (lots of investigations of union affairs); and opinion polls show that the public is now less sympathetic to union causes.

Within the next decade, we'll see significant changes in the four unions. Three STEEL editors, Jack Botzum, Don Postma, and Bill Wallace, will begin focusing the binoculars for you next week. They're writing a series of four articles to appraise union practices and policies and to see how unions measure up to what looks like a new set of ground rules.



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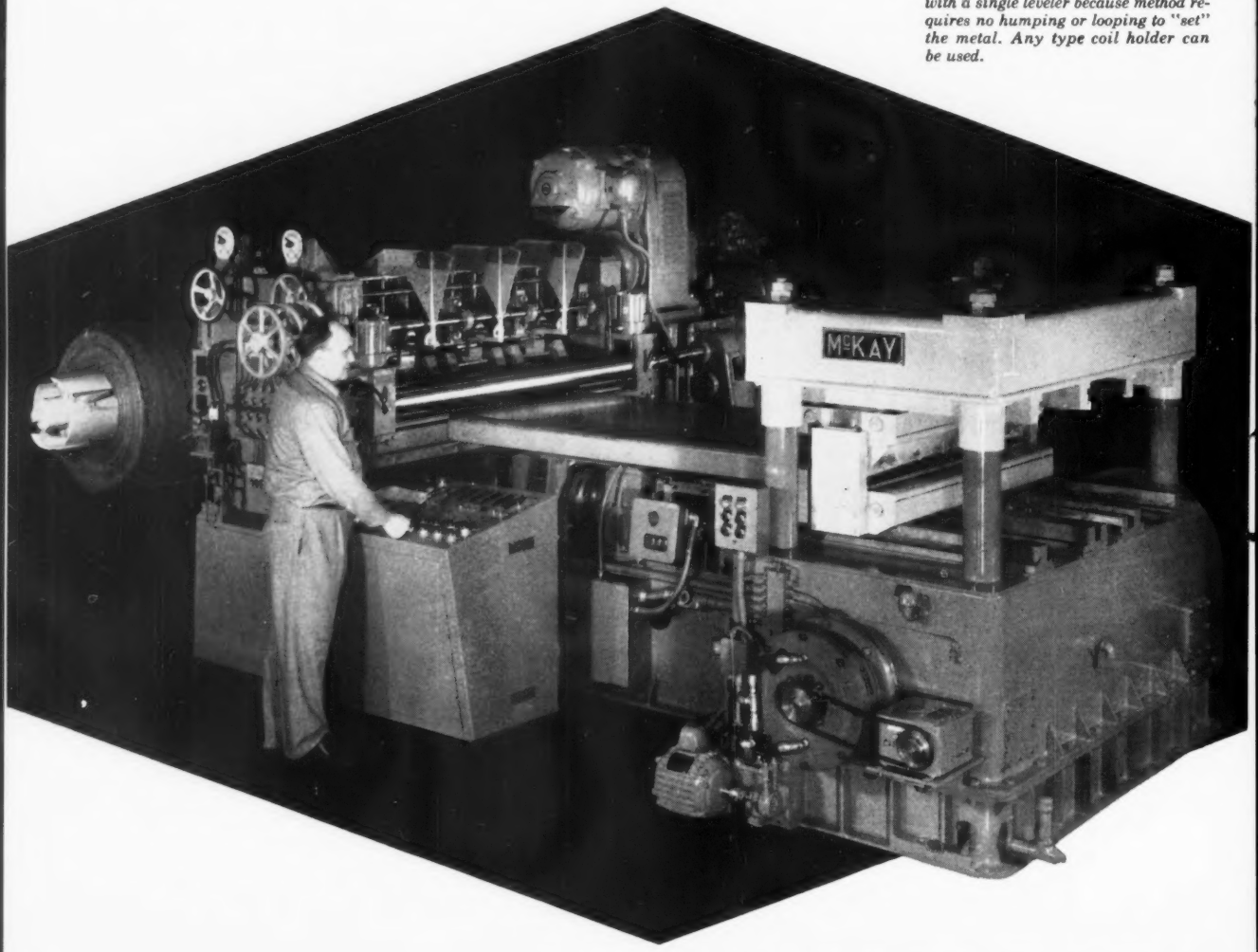
AUTOMATIC, INSTANTANEOUS *because of highly accurate electronic counting and measuring mechanisms. Operator simply sets length and quantity by push buttons, shear does the rest. Punched tape or coded card control available.*

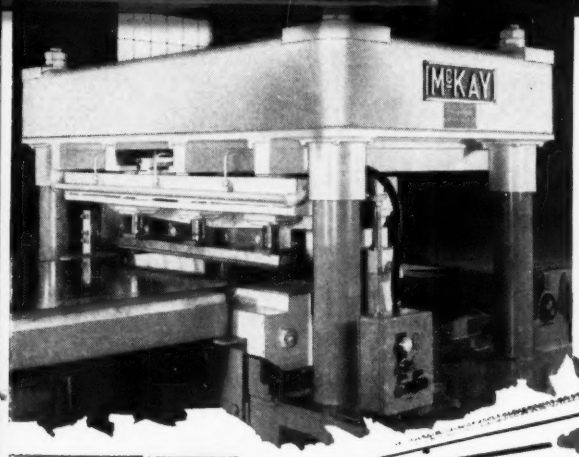
LOW MAINTENANCE *because all drives and controls are simplified AC type, electronic controls are proven standards, cutting dies are standard double-rake shear knives.*

Break

COMMERCIALLY FLAT SHEET *is possible with a single leveler because method requires no humping or looping to "set" the metal. Any type coil holder can be used.*



COMPACT . . . *never before has such a high production unit required so little area. Space saving, it's ideal for warehouse operations.*



through...

in AUTOMATIC SHEARING

Revolutionary McKaymatic* high production Die Shear line instantly responds to length and Quantity Command

Now—a high production cut-to-length line that meets *all* the requirements of modern day coil shearing. It's the revolutionary new McKaymatic* Die Shear Line and it's fast, extremely accurate, instantly adjusted, compact and relatively low in cost!

The McKaymatic* is applicable for use wherever sheet metal is used. Ferrous and non-ferrous mills, fabricators or warehouses should see this amazing new line before they decide on the purchase of new coil shearing equipment.

UNMATCHED FLEXIBILITY offered by a simplified electronic control makes the changing of length of cut instantaneous. When length and quantity commands are changed (manually or automatically) the line reacts instantaneously without slowing down or stopping. EXACTING ACCURACY, also a product of electronics, is equal to or better than any other available equipment. HIGH PRODUCTION, regardless of the number of length changes is possible because there is no downtime for length changing, etc. LOW MAINTENANCE is possible because the line is designed around simple AC drives and controls, and proven electronic components.

There's nothing like it—for large orders or small—in any width or thickness. Here for the first time is practical push button shearing, and it's easily adapted for standard coded card or punched tape systems. For details write today. *The McKay Machine Company, Youngstown 1, Ohio.* *TM

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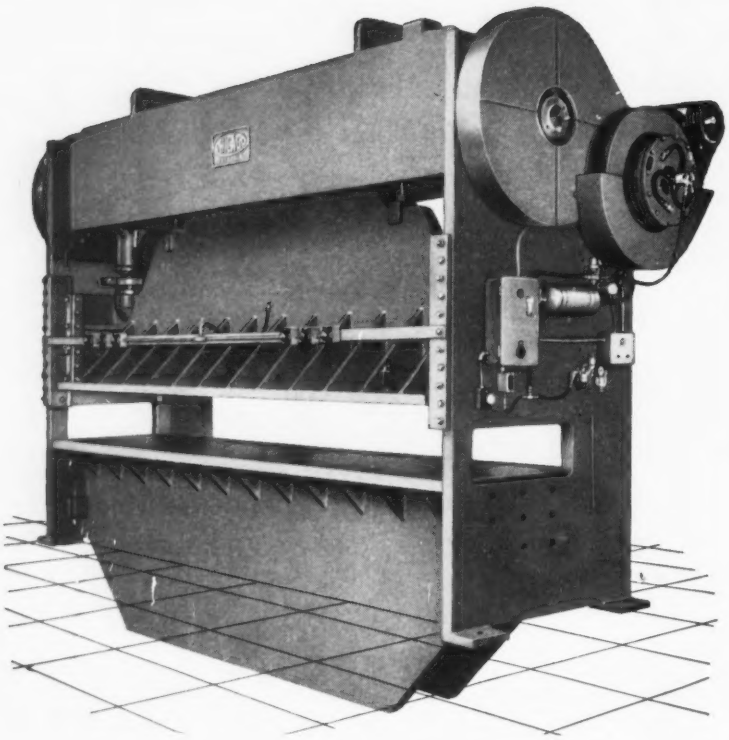

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large die area
capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

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CALENDAR
OF MEETINGS

July 29-Aug. 1, National Tool & Die Manufacturers Association: Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Aug. 9-12, American Society of Mechanical Engineers and American Institute of Chemical Engineers: National heat transfer conference and exhibit, University of Connecticut, Storrs, Conn. Information: Prof. David A. Fisher, Mech. Eng. Dept. U-37, University of Connecticut, Storrs, Conn.

Aug. 10-13, Society of Automotive Engineers: National west coast meeting, Hotel Georgia, Vancouver, B. C. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 18-21, Western Electronic Show and Convention: Cow Palace, San Francisco. Information: WESCON, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

Aug. 19-29, National Screw Machine Products Association: Sales conference, Wade Park Manor Hotel, Cleveland. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Aug. 31-Sept. 2, Metallurgical Society of AIME: Institute of Metals Division's conference on semiconductors, Statler-Hilton Hotel, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting. Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N. W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, American Mining Congress: Metal mining and industrial minerals convention, Denver. Congress' address: Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

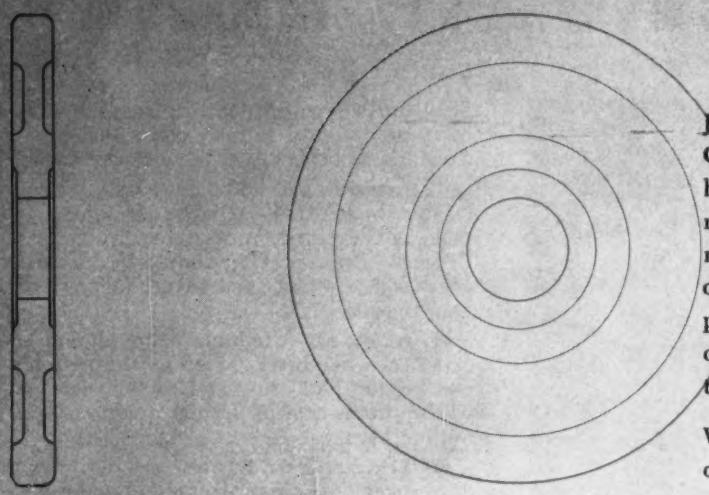
A NEW HIGH

IN METALLURGICAL PROPERTIES FROM EXOTIC METALS

Jet engine components made from Cameron forgings have hit a new high in forming and in metallurgical refinements, developing not only room temperature properties 20% over specifications but, more importantly, producing these same over-specification values at elevated temperatures.

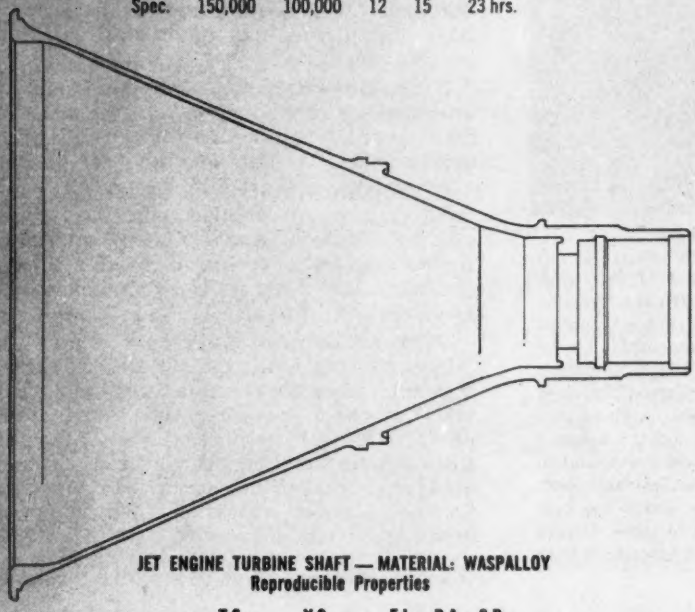
With our special forging techniques, one heat and one push produce uniform properties from surface to center, and from hub end to flange end. Even in high density alloys, interesting economy is effected. Favorable billet to finished forging weight ratio means less of the expensive material is used in each operation. Because of improved grain structure and close controls throughout the entire process, machining qualities are excellent.

All this, of course, gives our customers a better component functionally and economically. Check the accompanying comparison of the specification values and obtained values on the two jet turbine rotating components shown—let us show you what we can do with your problem forgings—just CALL, WRITE, or COME BY



JET ENGINE TURBINE DISC — MATERIAL: INCO 901

	T.S.	Y.S. .2%	E.L.	R.A.	S.R. 1200° F. 80,000 lb./sq. in.
	175,000	128,000	20	23	225 hrs.
Spec.	150,000	100,000	12	15	23 hrs.



JET ENGINE TURBINE SHAFT — MATERIAL: WASPALLOY
Reproducible Properties

	T.S.	Y.S. .02%	E.L.	R.A.	S.R. 1350° F. 70,000 lb./sq. in.
	196,200	131,700	23	32	71 hrs.
Spec.	160,000	90,000	15	18	23 hrs.

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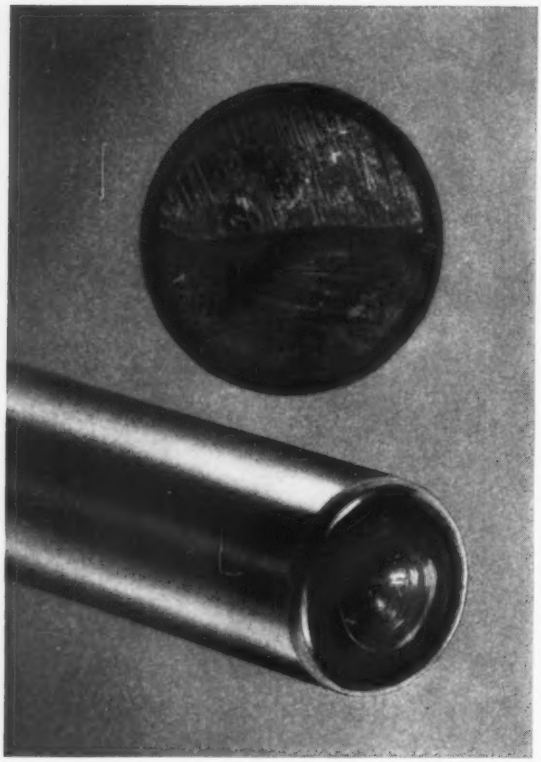
SPECIAL PRODUCTS DEPARTMENT
P. O. Box 1212, Houston, Texas

You benefit seven ways from Republic Steel Bar

SERVICE IN DEPTH



COLD DRAWN CARBON CORRECTED BARS HELP BRIGGS & STRATTON BOOST PISTON PIN PRODUCTION. The company was experiencing production difficulties and was not satisfied with piston pin quality from a performance standpoint. On the advice of a Republic Field Metallurgist, Briggs & Stratton switched to Republic C-1050 Cold Drawn Carbon Corrected Bars. The results were immediate. Production increased substantially. Rejects dropped to a minimum. Pin quality maintained at the highest level. Other advantages of Cold Drawn Carbon Corrected Bars include: Better machinability. Savings in both metal and money by eliminating waste. No need to buy bars oversize to allow for decarb removal. Photo shows finished piston pin used in Briggs & Stratton 1¾ to 3 hp engines. Note induction hardening in cutaway view.

Steel bar service in depth is an exclusive Republic concept, designed to help you solve steel bar problems and to benefit you these seven ways:

1. Facilities—Republic bar mills are strategically located in relation to major use areas. Hot rolled mills at Cleveland, Youngstown, Buffalo, Massillon, Chicago, Canton, Gadsden; cold finished mills at Massillon, Hammond, Beaver Falls, Hartford, and Los Angeles.

2. Abilities—Republic's broad and specialized experience has been gained as the nation's number one producer of alloy and carbon bars, and leader in the production of special quality steels, such as forging bars.

3. Shapes and Sizes—Modern bar mills produce a complete range of sizes and materials—carbon, alloy, stainless, and titanium—in ¼″ to 10″ rounds, also squares, hexagons, octagons, flats, and special sections.

4. Variety—In addition to regular merchant quality, production includes coil spring and spring bar quality, cold heading and cold extrusion quality, high quality alloy and carbon steel bar products in heavier weight coils.

5. Quality—Republic combines quality control at every step of production with the most advanced features of bar mill design to meet today's exacting requirements for high quality steel bar products.

6. Dependability—Republic's aim has been to build capacity to provide more steel tonnage for existing customers as well as supply additional users. Assurances of steel to customers are real assurances. Orders are not taken by Republic unless capacity is available to fill them.

7. Metallurgical Service—Republic's famed 3-Dimension Metallurgical Service Teams—field, mill, and laboratory—are always available to help your personnel apply Republic's high quality bar products to your product. Carbon, alloy, stainless, and titanium metallurgists will assist in the selection, application, and processing of the right bar product for the job. No obligation. The coupon is your invitation to use this service.

Here are three examples of steel bar *service in depth*.

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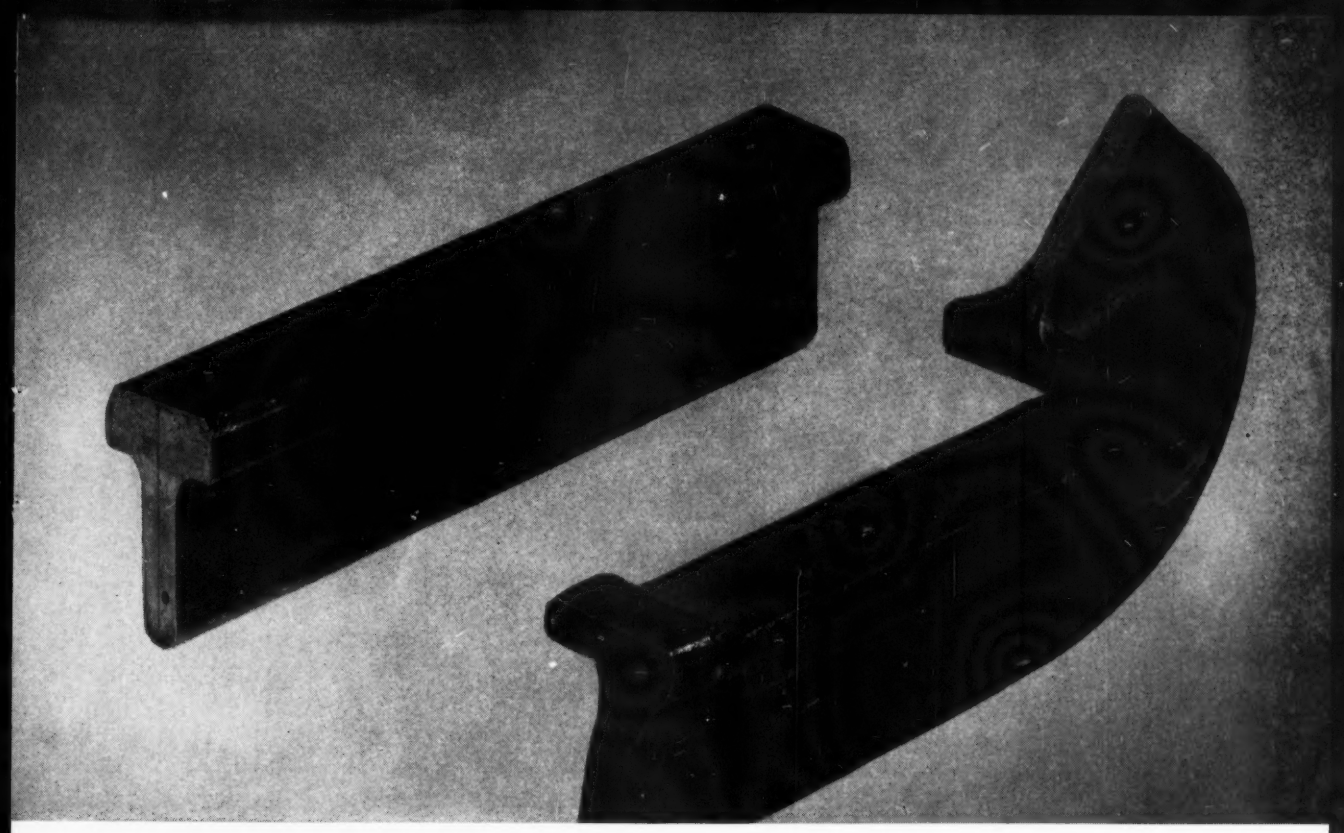
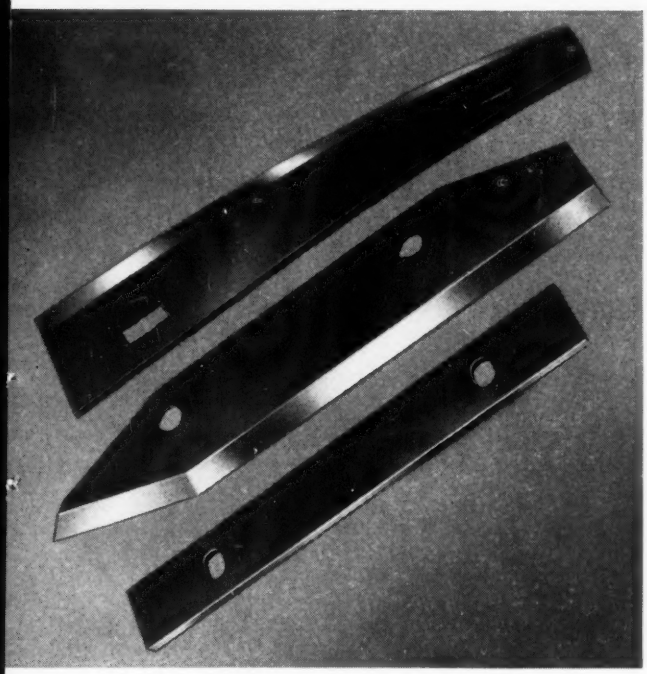
World's Widest Range of Standard Steels





REPUBLIC HOT ROLLED SPECIAL SECTION REDUCES COST on this rail anchor through elimination of most machining and forming operations. The special section is preformed to the predominating cross section of the part. If you design or produce steel parts you will be interested in these advantages of Republic Special Sections: (1) Almost limitless flexibility in design. (2) One-piece shapes replace costly assemblies. (3) Simplification of built-up, interlocking or associated parts. Republic Special Sections are available hot rolled or cold drawn in carbon, alloy, titanium, and stainless steel. Send coupon for full facts.

3-D METALLURGICAL SERVICE HELPS AGRICULTURAL KNIFE MANUFACTURER SLASH PRODUCTION COSTS. Lund Products Company, Maynard, Massachusetts, produces cutting knives for agricultural equipment. A quality product, Lund wanted to make them better to withstand even the most severe abuse. Republic metallurgists offered advice on practices and procedures in working alloy steels. The result? A superior cutting knife, produced at a substantial reduction in cost. 3-D Service is available to all steel users without obligation. Clip and mail coupon.

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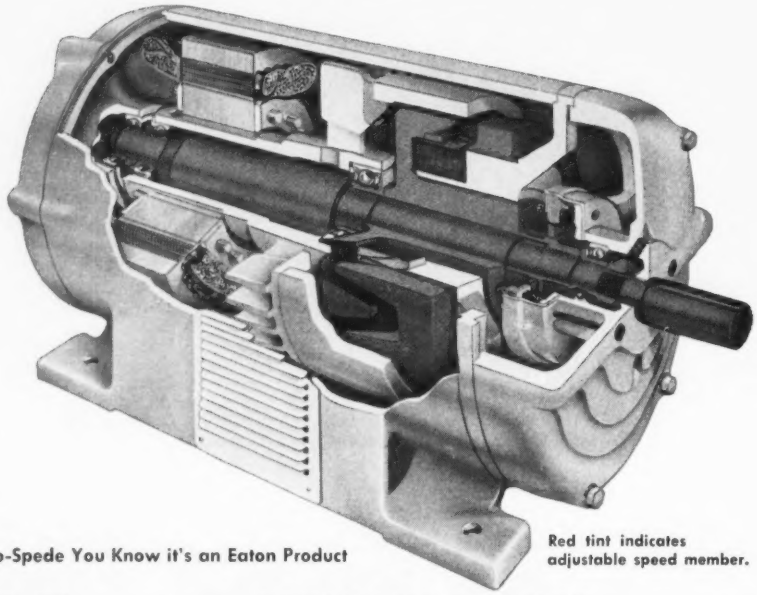

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At their modern plant in Wichita, Kansas, Western Control Corporation produces flexible controls that are specified for many applications from lawnmowers to giant excavators. This wide range is the result of closely controlled quality and cost at Western Control. Western has successfully used Keystone MB Spring Wire since its inception in 1946. Here are some reasons they give:

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CONTROL OF QUALITY — Company officials report, "Uniformity of temper and size of Keystone MB Spring Wire gives us close inside and outside diameter tolerances. Coating, too, is superior — no flaking or stripping in the manufacturing process."

CONTROL OF COSTS — Keystone furnishes drawn galvanized MB Spring Wire to Western in pay-off packs. This means less waste — less set up time — less handling time — and cleaner wire. To Western, this means a quality product at a competitive price.

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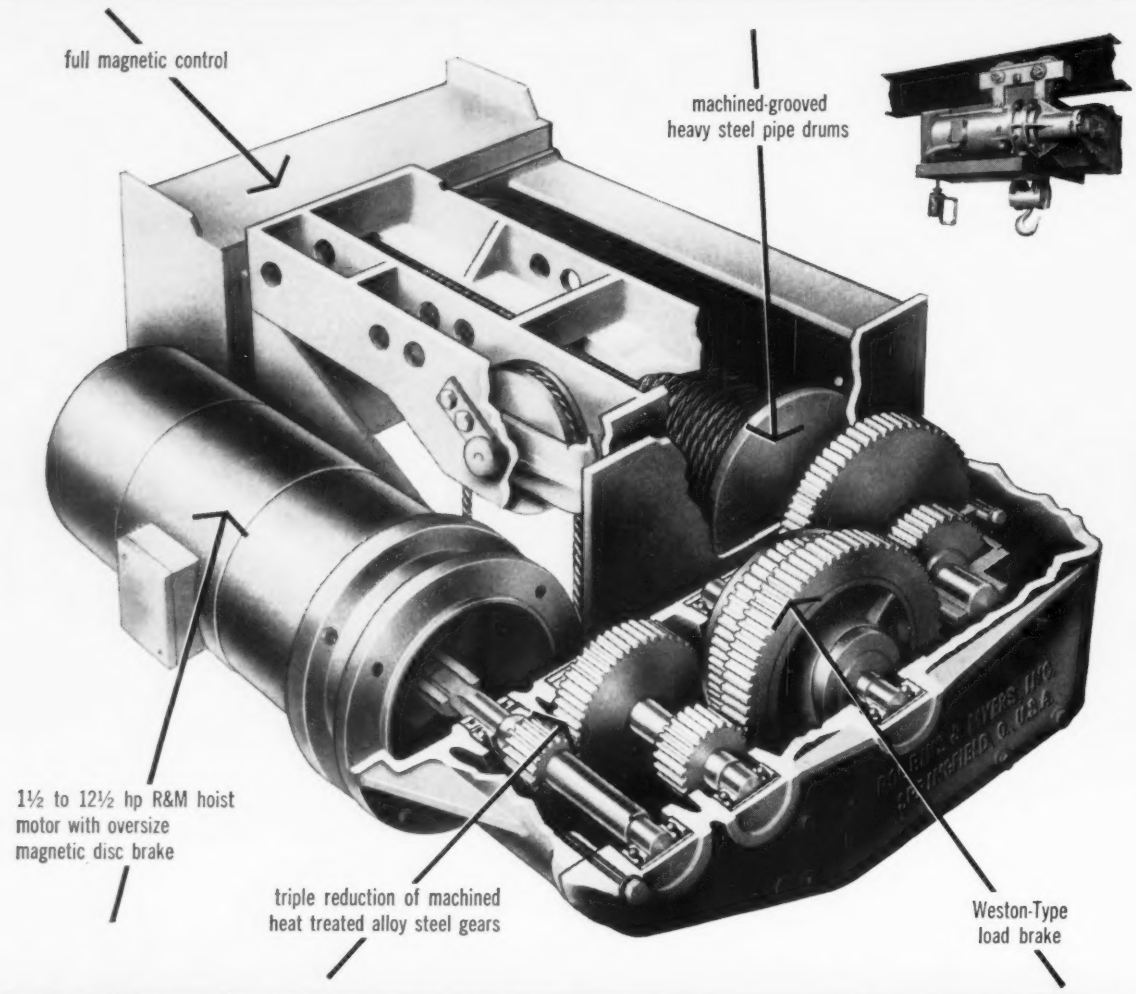
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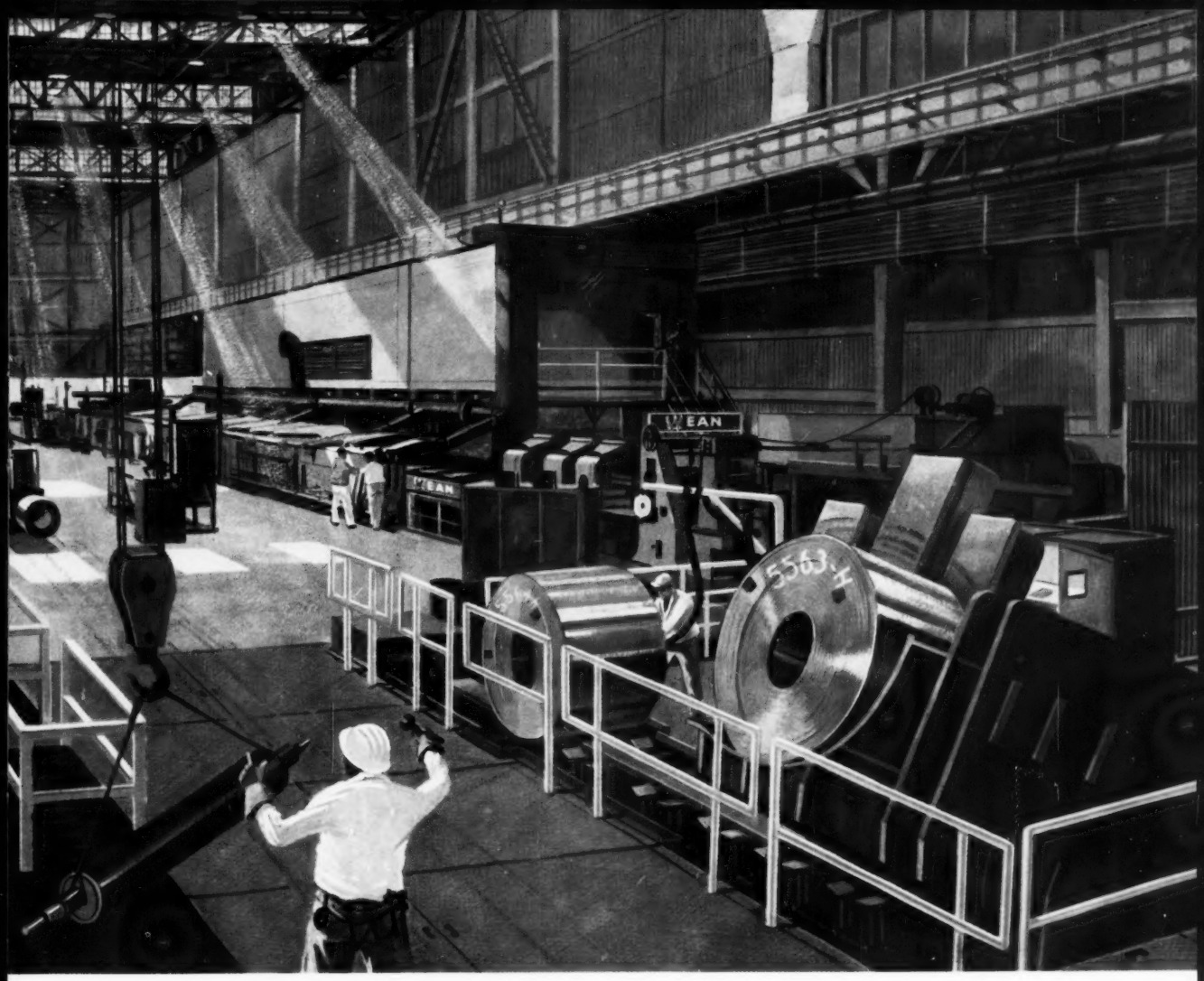

Continuous Electrolytic Cleaning Line, Indiana Harbor Works, Inland Steel Company

Wean, Inland and Cleaning . . .

Operating at speeds up to 2500 fpm, this Wean tension-type, electrolytic cleaning line has replaced two older washer lines at the Indiana Harbor Works of Inland Steel. It employs grid-to-grid application of electrolytic current to the strip for efficient removal of oil and residue resulting from cold reduction. The line handles coils 18″ to 42″ in width and weighing up to 40,000 pounds.

Of all electrolytic cleaning lines in use today, 80% have been built by Wean, leader in the design and construction of all types of coil processing lines. If you are planning to expand or modernize your sheet, strip, or tin plate finishing facilities, Wean's *creative engineering* can mean important savings to you.

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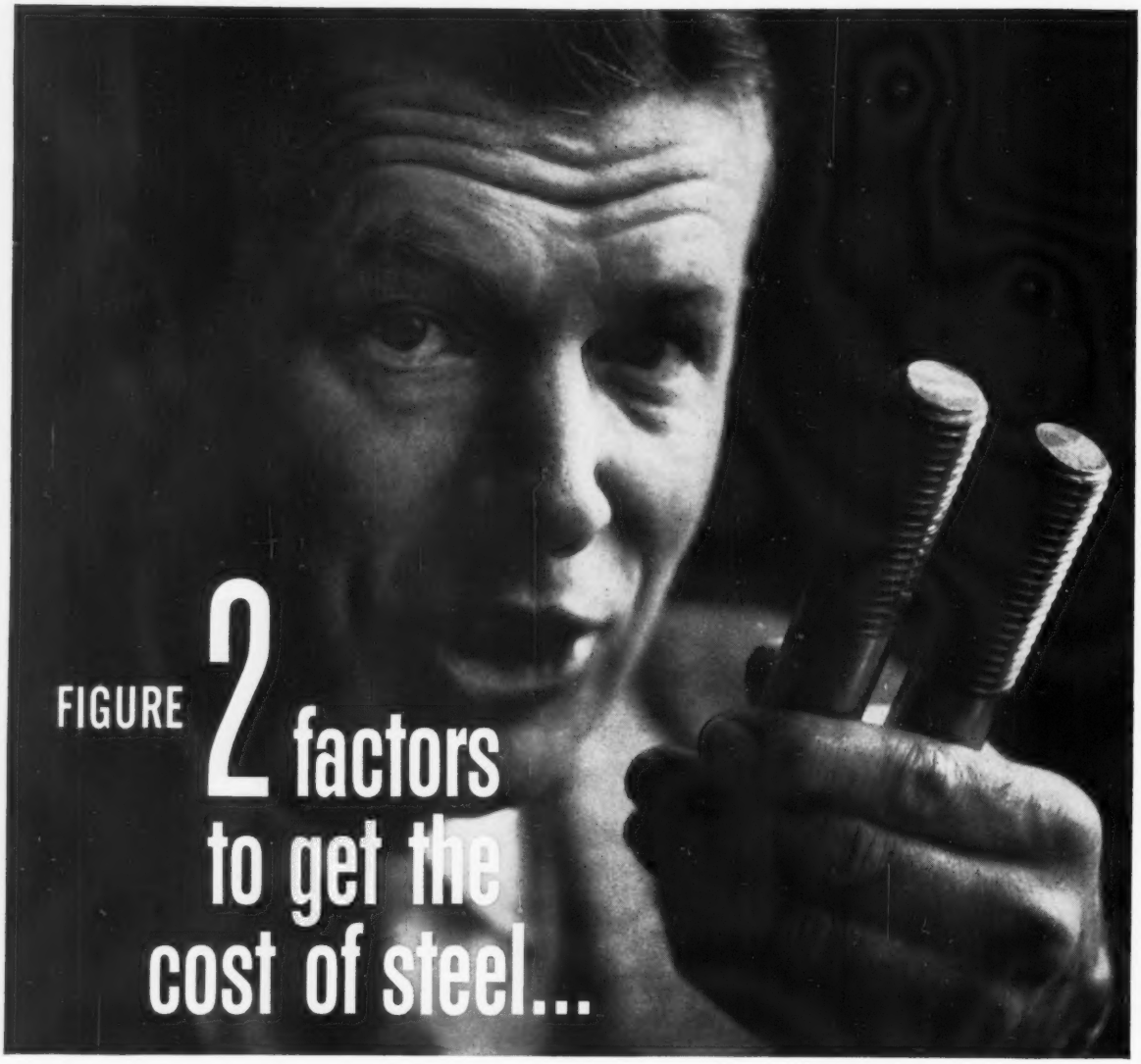

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The high cost of possession may surprise you. It has surprised many a smart, informed steel user.

When your Steel Service Center performs first cutting operations you save operating and capital costs of the equipment it requires. You get steel delivered quickly from stock, ready for use. You save costs of storage and handling. You cut scrap loss and wastage.

There's a nearby Steel Service Center set up to serve you, not only with steel, but with technical know-how.

If you are buying more than three months' inventory because you think it's a bargain, compare *all* of your costs with the cost and *freedom from risk* of buying from your Steel Service Center. For more information, get the booklet, *What's Your Real Cost of Possession for Steel?* from your Steel Service Center. Or write to American Steel Warehouse Association, Inc., 540-G Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	
Cost of capital:	
Inventory	
Space	
Equipment	
Cost of operation:	
Space	
Materials handling	
Cutting & burning	
Scrap & wastage	
Other costs:	
Obsolescence	
Insurance	
Taxes	
Accounting	
TOTAL	

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

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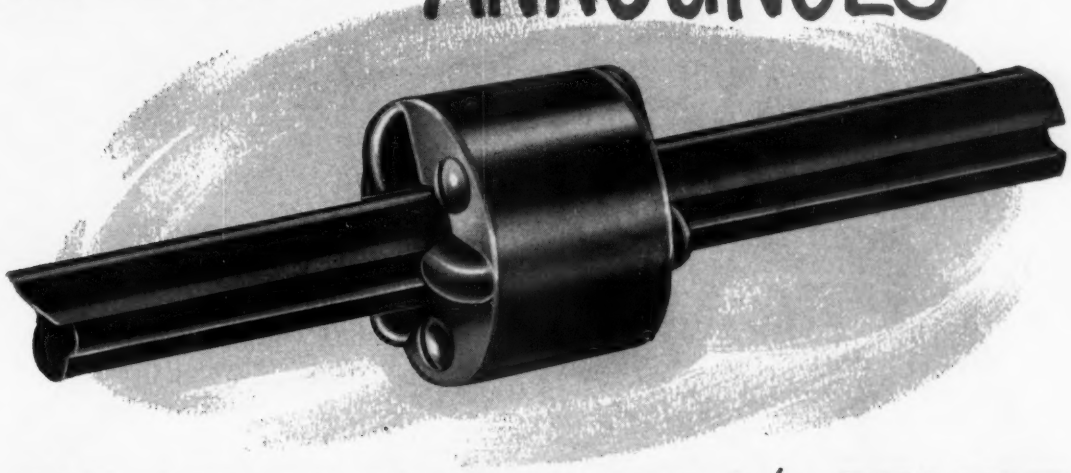


A NEW SERIES OF STANDARD b/b SPLINES AT LESS THAN HALF FORMER COST!

Average 40 TIMES Lower Coefficient of Friction than Conventional Sliding Splines— Far Better Performance at Comparable Cost

Good news for machine tool, aircraft and other designers! Standardization and volume production economies now enable you to take full advantage of this revolutionary ball/bearing Spline, built on the same gliding ball principle pioneered by the famous Saginaw b/b Screw.

Wherever easy linear movement is required under high torque load, Saginaw Standard b/b Splines offer:

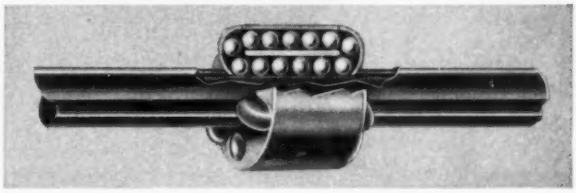
- ***Freedom from Frictional Heat*** • ***Minimum Radial Lash*** • ***Long, Trouble-free Service Life***

HIGH PRECISION COMMERCIAL QUALITY

These new low-cost Standard b/b Splines are high commercial quality with excellent precision and service life, suitable for all but the most critical applications. Yet they cost about the same as high-friction splines.

TRANSMIT OR RESTRAIN HIGH TORQUE LOADS NO OTHER SPLINE CAN HANDLE

Standard b/b Splines are so friction-free that they permit previously impossible applications under very heavy torque loads, where the effort required to slide conventional splines would exceed the structural strength of members. They literally let you achieve the "impossible"!



Saginaw b/b Splines transmit or restrain high torque loads with far less friction because mating surfaces *glide* on rolling balls instead of *sliding* back and forth. Steel balls recirculate in closed circuits formed by mating longitudinal raceways spaced around the circumference of inner and outer parts.

6 STANDARD SIZES

.375 .625 1.000 1.500 2.000 2.500

Can be fitted with integral gears, clutch dogs, bearing and sprocket seats or other attachments for use with electrical, hydraulic or pneumatic units.

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Saginaw ball/bearing Screws & Splines

SAGINAW STEERING GEAR DIVISION OF GENERAL MOTORS CORPORATION, SAGINAW, MICHIGAN

WORLD'S LARGEST PRODUCER OF BALL/BEARING SCREWS AND SPLINES

The Image of CF&I

THE CF&I GIANT stands for "steelmanship"—the science of developing new and improved steel products for all industries. An example of how CF&I's continual research benefits *wire users* is our new Black Satin finish on Round and Square Oil Tempered Wire.

Available only from CF&I, Black Satin is a fine, powdery finish that works as a lubricant during coiling and crimping operations. This unique finish is the result of tempering the wire under electronically controlled atmospheric conditions.

Uniformity of Black Satin Oil Tempered Wire Cuts Production Costs

This special finish is uniform throughout the length of each coil . . . from coil to coil . . . from lot to lot. Black Satin's powdery finish prevents surface scale "flake off"—a problem with ordinary Oil Tempered finishes that require constant readjustment of your initial setup. Your benefits: less downtime, less scrap loss, uniform end products.

Black Satin Finish Increases Output

To lengthen your production runs, CF&I can supply you with this top quality Oil Tempered Wire in continuous unwelded lengths up to 600 lbs. These large coils minimize the extra rethreading time required by smaller coils.

This outstanding Oil Tempered Wire is available in a full range of gages and sizes, in steel-strapped or wire-tied coils from 16″ to 72″ in diameter. Straightened and cut lengths from 6″ to 24′ (or longer) can also be supplied.

Identification Tags Assure Uniform Wire Grades

To assure the same steadfast quality from coil to coil, CF&I color tags every coil for a reliable record of its processing, testing and intended use. By merely returning the tags when you reorder, you automatically receive the same uniform quality on all subsequent orders for the same grade of wire.

offers . . .

BLACK SATIN

a unique Oil Tempered wire finish to cut your production costs

These tags show:

Heat Number_____

Size_____

Tensile Strength_____

Date_____

Coil Number_____

Test Sheet Number_____

This color tag system also facilitates your job of inventory control, in-plant storage, and materials handling.

Besides Oil Tempered Wire, CF&I supplies all types of quality steel wire—and you can specify your wire *packaged for your production.* These different packages offer you various operating advantages from less machine downtime to easier unloading, storage, inventory control and continued cleanliness of the wire.

Because of CF&I's wide diversity of wire types and wire packages, it would pay you to make CF&I your source of supply. Our experienced representative will be glad to discuss your requirements with you. Call him today.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

6770

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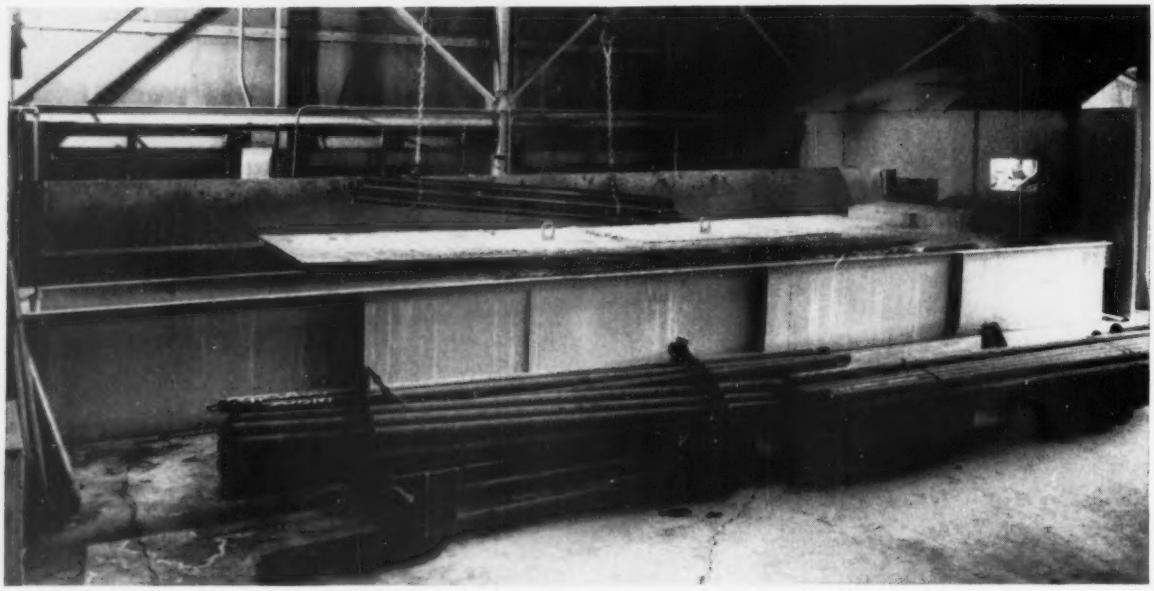
CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

THE TIMKEN COMPANY CUTS DESCALING TIME



FROM 90 MINUTES TO 30 MINUTES

How Virgo® Descaling Salt gives faster, safer cleaning.

It used to take as much as ninety minutes of straight acid pickling to descale these stainless steel tubes at the Gambrinus Works of The Timken Roller Bearing Company.

Since switching to Virgo Descaling Salt, The Timken Company reports that descaling cycles have been cut down to *one-half* hour with actual acid pickling time reduced to 10 minutes. Equally important too, is the improvement in surface quality.

In the same bath, which handles bundles up to 37 feet in length, the tubes are degreased.

Get these other Virgo advantages in your descaling:

Besides stainless and alloy steels, Virgo Descaling Salt descales titanium and its alloys. You can even handle both types of metal in the same bath.

Virgo Salt reacts only with scale. There's no loss of base metal, no pitting or etching. There's no danger of hydrogen embrittlement.

The Virgo bath is safe and simple to operate, using normal precautions. Bath temperatures run from 800 to 1250°F.

You can descale strip, sheet, bars, wire, tubes, castings, or any other form to a chemically clean surface.

You use much less acid with the Virgo process.

For more information on how Virgo Descaling Salt works, write for Bulletins 25 and 25-T (Titanium).

Help for your other metal cleaning operations.

Desanding. Use Virgo Electrolytic Salt to remove sand, graphite, other impurities—produce a chemically clean surface.

Reclaiming parts loaded with carbon or rust. Virgo Molten Cleaner works fast—is the quick answer for large-scale salvage operations.

Vapor degreasing. You get unique stability—degrease more parts between cleanouts—using Nialk® *Trichlor*ethylene with *psp* (permanent staying power).

Stripping, acid neutralizing. You can get Hooker caustic soda in four convenient flake sizes, in new easy-to-empty drums with 18" openings.

Acid cleaning, pickling. You can get Hooker muriatic acid in 4,000-, 6,000- or 8,000-gallon tank cars.

Plating with tin-zinc, tin, silver, copper. Get the benefit of more than 50 years' experience in potash production, when you specify Nialk® caustic potash for your plating operations.

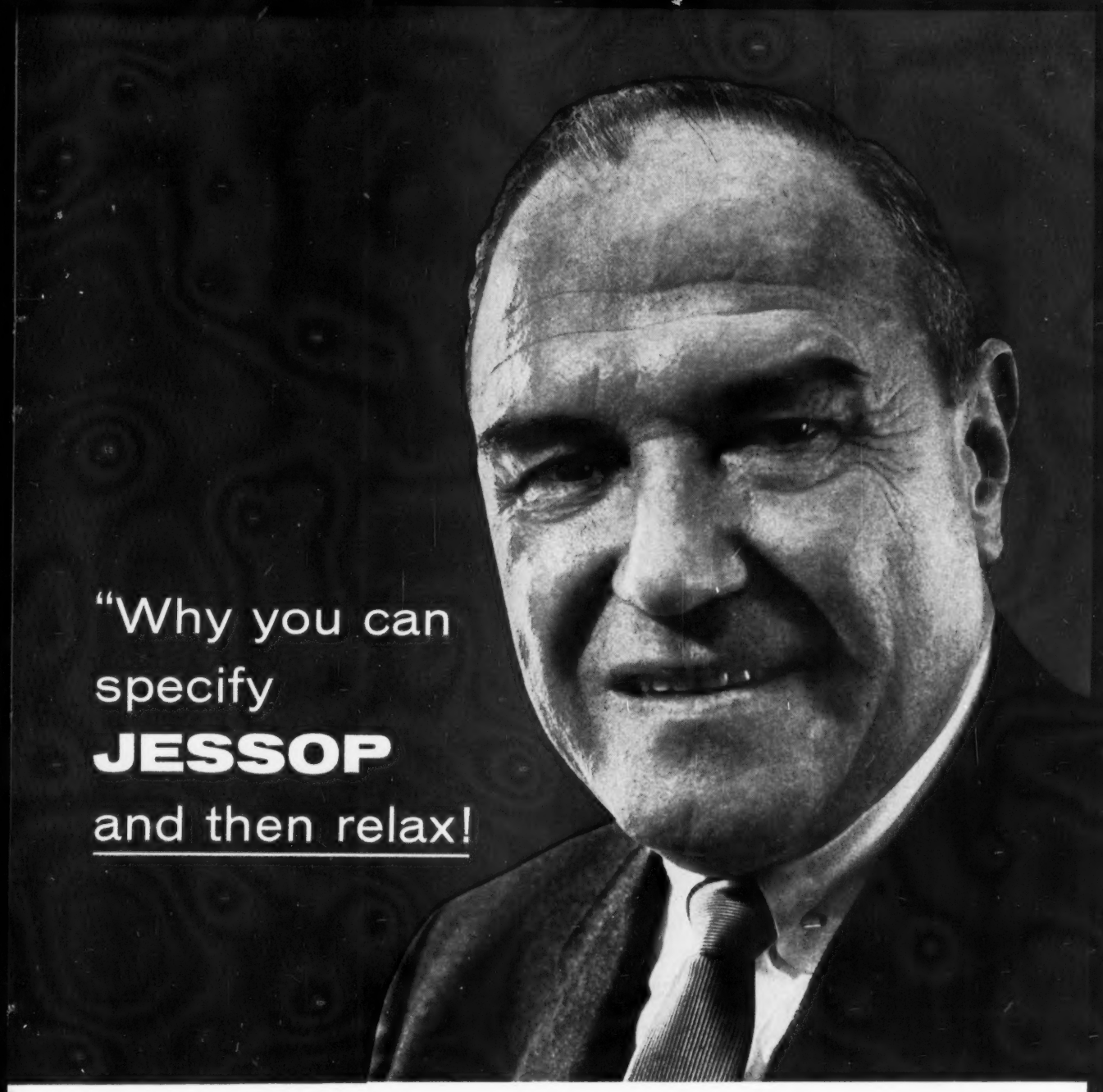
For literature on any of these Hooker chemicals for metals, just write us on your business letterhead.

HOOKER CHEMICAL CORPORATION

1207 Union Street, Niagara Falls, N. Y.

HOOKER CHEMICALS PLASTICS

Sales Offices: Chicago, Ill.; Detroit, Mich.; Los Angeles, Calif.; New York, N. Y.; Niagara Falls, N. Y.; Philadelphia, Pa.; Tacoma, Wash.; Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B. C.



"My name is Tom Gabriel—vice president in charge of sales for Jessop's high speed and tool steels, ground flat stock and composite die sections. Of all the reasons why it pays to specify our specialty steels, none tops this one from a repeat customer—*'Jessop has a greater sense of responsibility.'*

"We have earned this reputation for responsibility. It comes from a continuous employee training program stressing these facts . . .

"The cost of Jessop 'jewelry' steel is small compared to the cost of working that steel into finished products. That's why our customers must get perfect steel. That's why every man on the Jessop team strives to be a perfectionist. Because of this greater sense of responsibility, repeat customers know they can always depend upon *consistent* high quality.

"When you need faster delivery of high quality specialty steels—*Specify Jessop . . . and then relax.*"

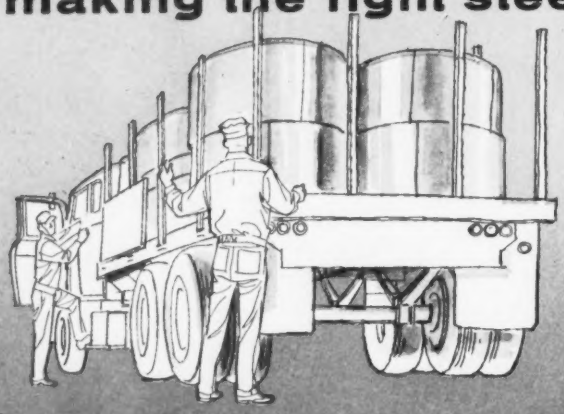
VMA 6743

JESSOP
STEEL COMPANY
Washington, Pennsylvania
OFFICES IN PRINCIPAL CITIES

Stainless, alloy, tool, cast-to-shape, and forging steels, precision ground flat stock, and other specialty steels

EXPERIENCE

in making the right steel



. . . for the right product

for 133 years

Broad EXPERIENCE in the production and distribution of cold rolled steel gives Alan Wood unique ability to find the right answers to your problems. Your Alan Wood Representative understands these abilities. He can suggest a metallurgical study of your situation. He has complete information on cold rolled steel and its application, and his advice on type, gauge and size to order can help you eliminate production problems . . . cut costs . . . increase profits.

Call your Alan Wood Representative today! He's always available . . . and ready to help.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN · PENNSYLVANIA

ALAN WOOD STEEL CO. ESTABLISHED A.W. 1826 CONSHOHOCKEN, PA.

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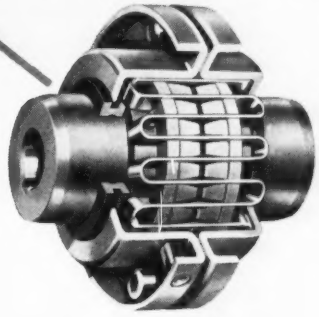
Montreal, Toronto and Vancouver, Canada—A. C. Leslie & Co., Limited

Photo shows portable pump unit connected to internal combustion engine by a Type F FALK Steelflex Coupling



How FALK STEELFLEX Couplings give your connected machinery Double Protection

FIRST: *They protect against shaft misalignment.* Some degree of shaft misalignment is unavoidable—and unless protective compensation is provided, additional loads are developed on shafts, bearings and other revolving elements. The result is excessive wear-and-tear—and often actual breakage....FALK Steelflex Couplings compensate for either angular or parallel misalignment—*or for the more serious condition involving both!* The exclusive Steelflex gridmember which joins the two hubs is not fastened to either hub; thus, either hub can shift in any direction without imposing a load on the other hub.

Yet, important as protection against shaft misalignment is to you, it is only one function of the *truly flexible* FALK Steelflex Coupling.

SECOND: *They protect against torque fluctuations* which create excess wear on connected machines and frequently induce destructive shaft misalignment. The exclusive FALK Steelflex grid-groove design cushions shock loads, dampens vibration, reduces impact loads as much as 30 per cent. You get this extra margin of protection that *can mean the difference between operating and breakdown!* You save on maintenance costs. And —you prolong the service life of your machines!...For complete information, ask your FALK Representative or Authorized Distributor. Or—**write direct for Bulletin 4100.**

FALK and STEELFLEX are Registered Trademarks

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

Representatives and Distributors in Most Principal Cities

Manufacturers of Quality Gear Drives and Flexible Shaft Couplings

Basic Type F FALK STEELFLEX COUPLING fills the needs of 90% of industrial applications

This cutaway view shows the exclusive Steelflex design which provides *torsional resilience with the strength of steel.* This torsional resilience spreads peak or shock loads over a relatively long increment of time, thus *greatly reducing stresses* in connected machinery.

The versatile Type F Steelflex can be used horizontally or vertically, without modification or special parts. It is ideally suited to 9 out of 10 applications. For unusual applications involving overload conditions, extended shafts, brakes, etc., standard designs of dual-purpose Steelflex couplings are available.

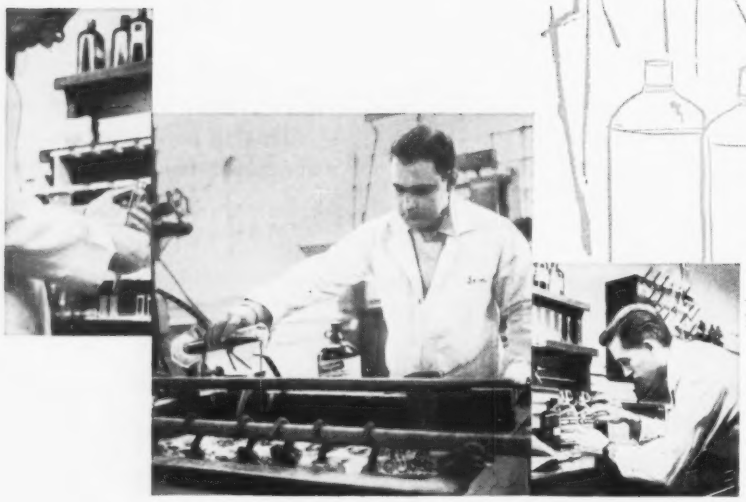
For most applications, you can give your machines the extra protection afforded by FALK Steelflex Couplings at no extra cost!

FALK

...a good name in industry

plating leadership ✻

SOLVE YOUR PLATING PROBLEM WITH



world's largest plating supplier

the **udylite**

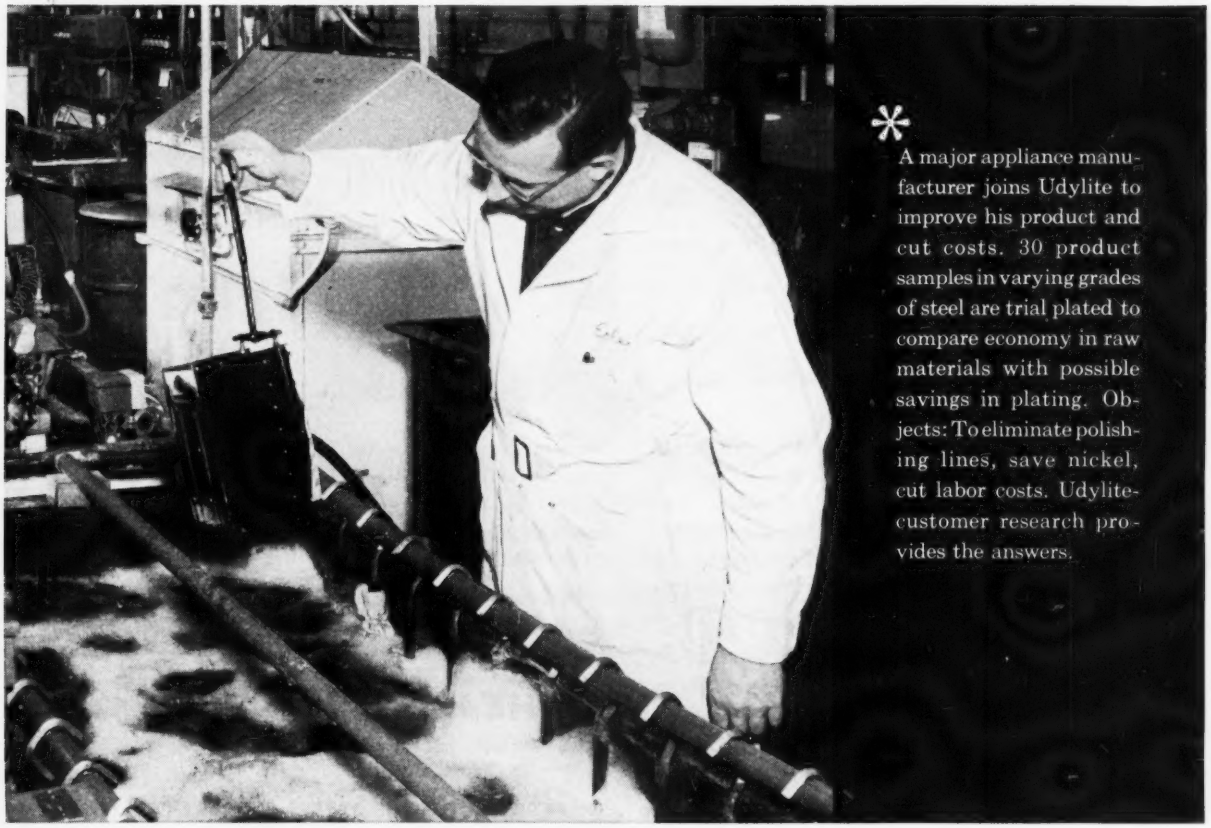
corporation

detroit 11, michigan

There is a customer-service laboratory reserved for your use at all times in Detroit. Udylite's Customer Service teams are established there exclusively to cooperate with you in anticipating those production stoppers that arise now and then . . . to save you countless man hours and dollars, too. Whether it's a solution you're not sure of, the choice of the best-possible procedure, or if you just want to "double check" before starting a big run, this Udylite service is yours. Your sample parts are examined by experts under the tightest laboratory controls. Pilot jobs are conducted under carefully simulated field conditions. Your solutions are the object of precise analysis. Discover how Udylite's complete Customer Service facility can help better your production. And it is just one of the many benefits that come to you from Udylite.

UDYLITE'S CUSTOMER SERVICE TEAM

. . . to produce better, more saleable products at lower cost

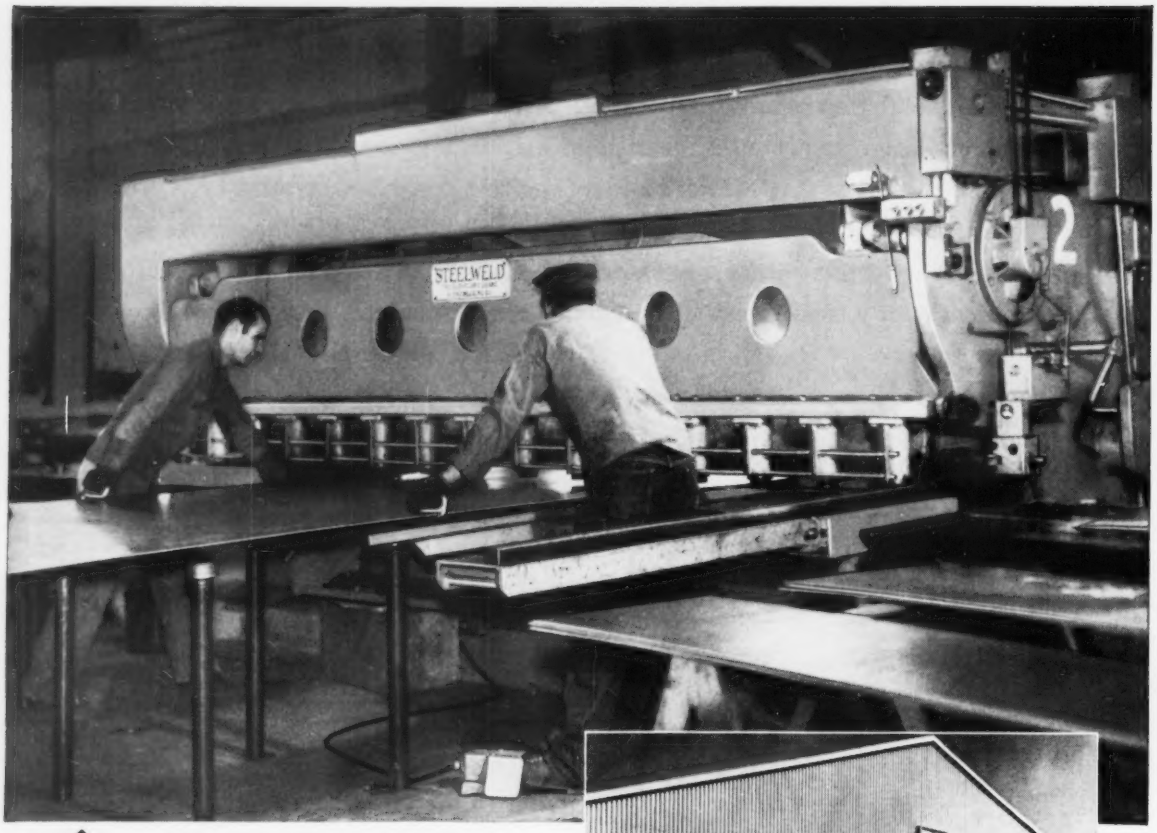


*A major appliance manufacturer joins Udylite to improve his product and cut costs. 30 product samples in varying grades of steel are trial plated to compare economy in raw materials with possible savings in plating. Objects: To eliminate polishing lines, save nickel, cut labor costs. Udylite-customer research provides the answers.

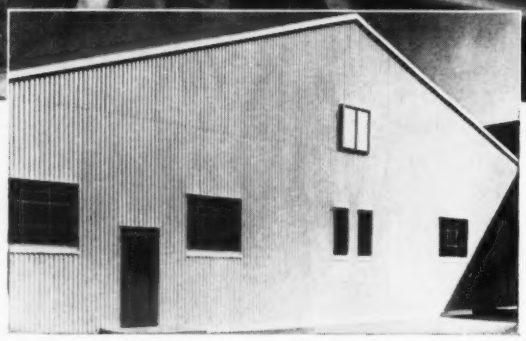
STEELWELD SHEAR

Operates 16 Hours a Day

Cuts Components for Prefabricated Buildings



Cutting and slitting operations normally keep this Steelweld Shear busy 16 hours a day. It is equipped with Steelweld's popular Micro-Set Knife Adjustment. This permits adjusting the knife clearance to suit the thickness of metal being cut in the matter of seconds. Thus, the finest cuts are assured for every shearing job.



A recent Pascoe Building.

RAPIDLY forging ahead in the prefabricated steel building field, Pascoe Steel Corporation, Pomona, California, has found its Steelweld Shear to be an extremely important factor in maintaining a steady rate of production. A large amount of shearing is required to fabricate several hundred tons of steel per month.

The Shear is normally operated 16 hours a day. It is used for cutting web plates for building columns, rafters and many other building components. About 20 hours a week it is used for slitting. The machine has functioned with very little maintenance. In nearly three years of service, the clutch has never required adjustment.

For the very latest in shears and brakes, mechanically or hydraulically operated, be sure to see what Steelweld has to offer.

Write for free copy of catalog No. 2011

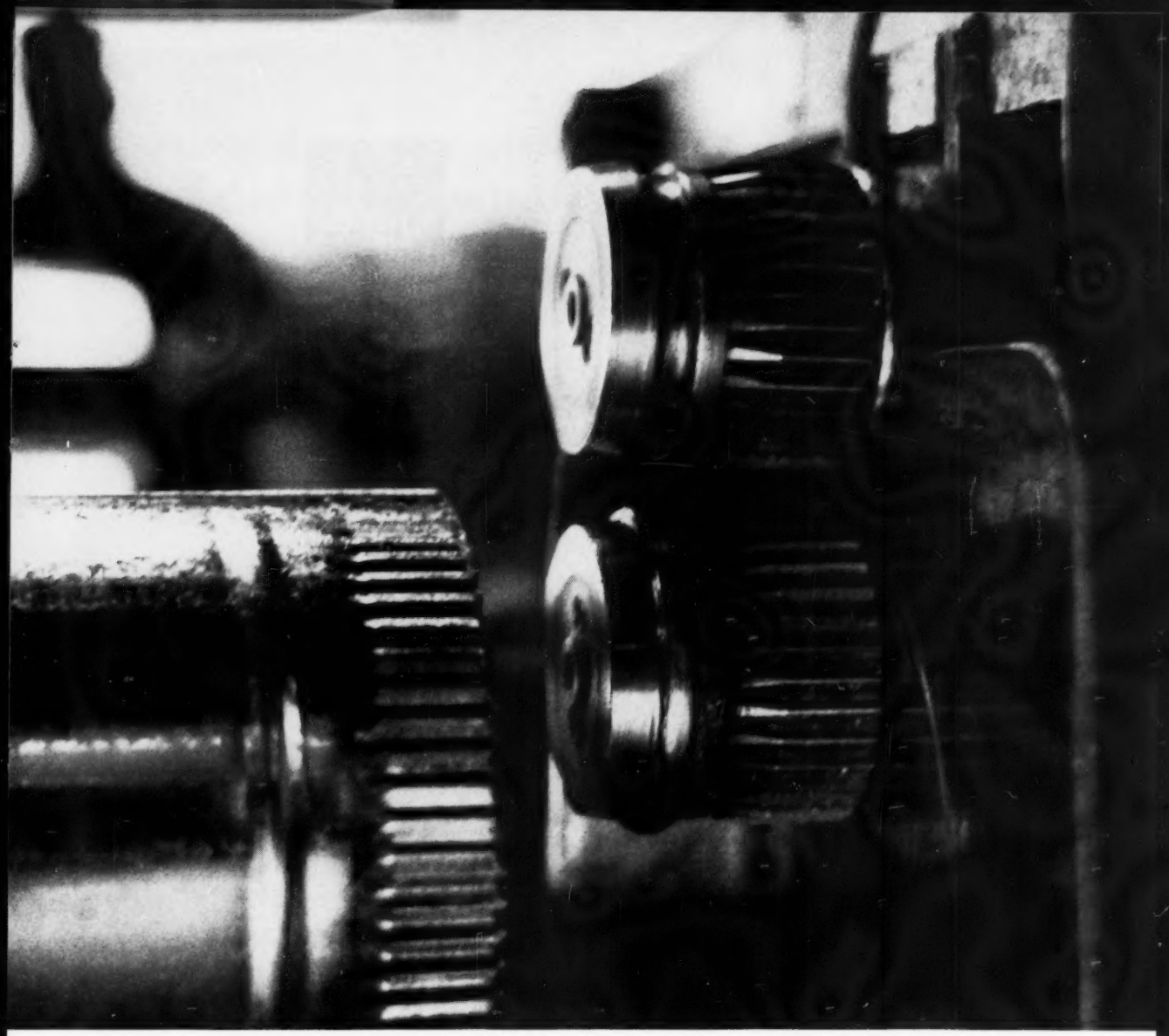
STEELWELD

Mechanical and Hydraulic

SHEARS PIVOTED BLADE

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

THE CLEVELAND CRANE & ENGINEERING COMPANY · 7859 EAST 282nd STREET · WICKLIFFE, OHIO



"NO REJECTS IN OUR WORK! WE CRIMP CHIP-PROOF WEIRKOTE"

See for yourself, as so many others have. Put zinc-coated Weirkote through its paces. Give it the business—the toughest, most tortuous jobs. Crimp it, bend it, twist it, spin it, draw it. Work it to the limits of the steel itself. Then take a close look.

Not a chip or flake mars its smooth zinc surface! And why should they? Weirkote's continuous process integrates zinc and steel so tightly that chipping and flaking do not occur and a new high in corrosion protection is assured.

Can you imagine what this means to repeated, top-notch production results? To the goodwill of your customers who will continually get the best finished products on the market? To your peace of mind, rid, at last, of annoying, costly rejects?

In spite of all these advantages, Weirkote's cost is low. One more good reason why you should write today for a free 12-page booklet that explains in detail how Weirkote can help you. Weirton Steel Company, Dept. B-8, Weirton, West Virginia.

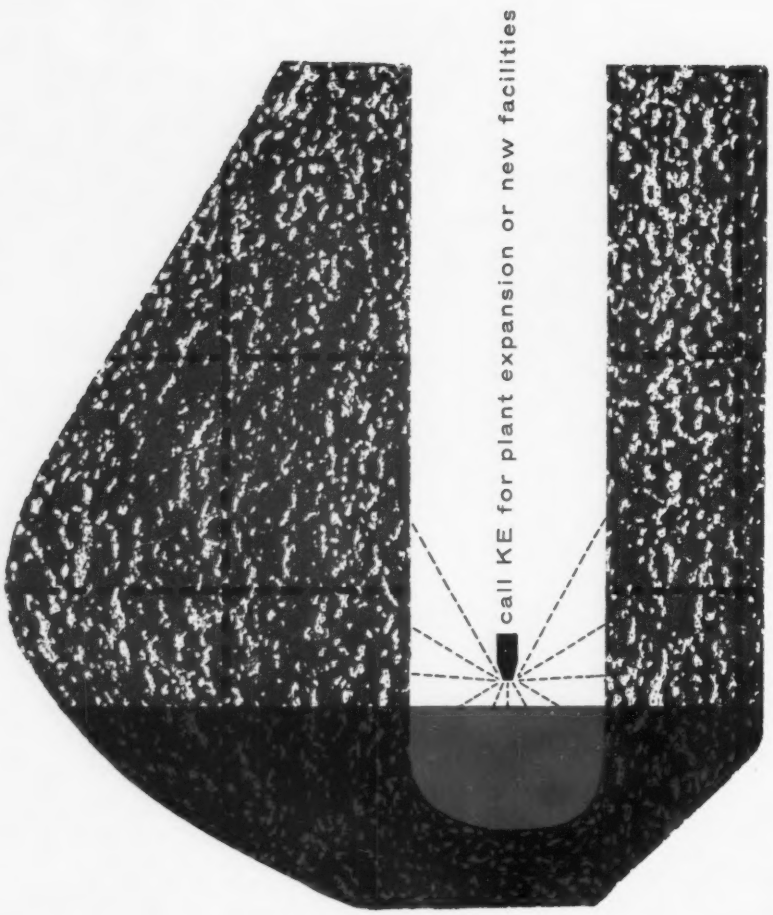
WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

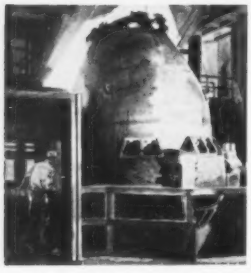
a division of

NATIONAL STEEL CORPORATION



INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that installed by KE at a major eastern steel plant.

Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

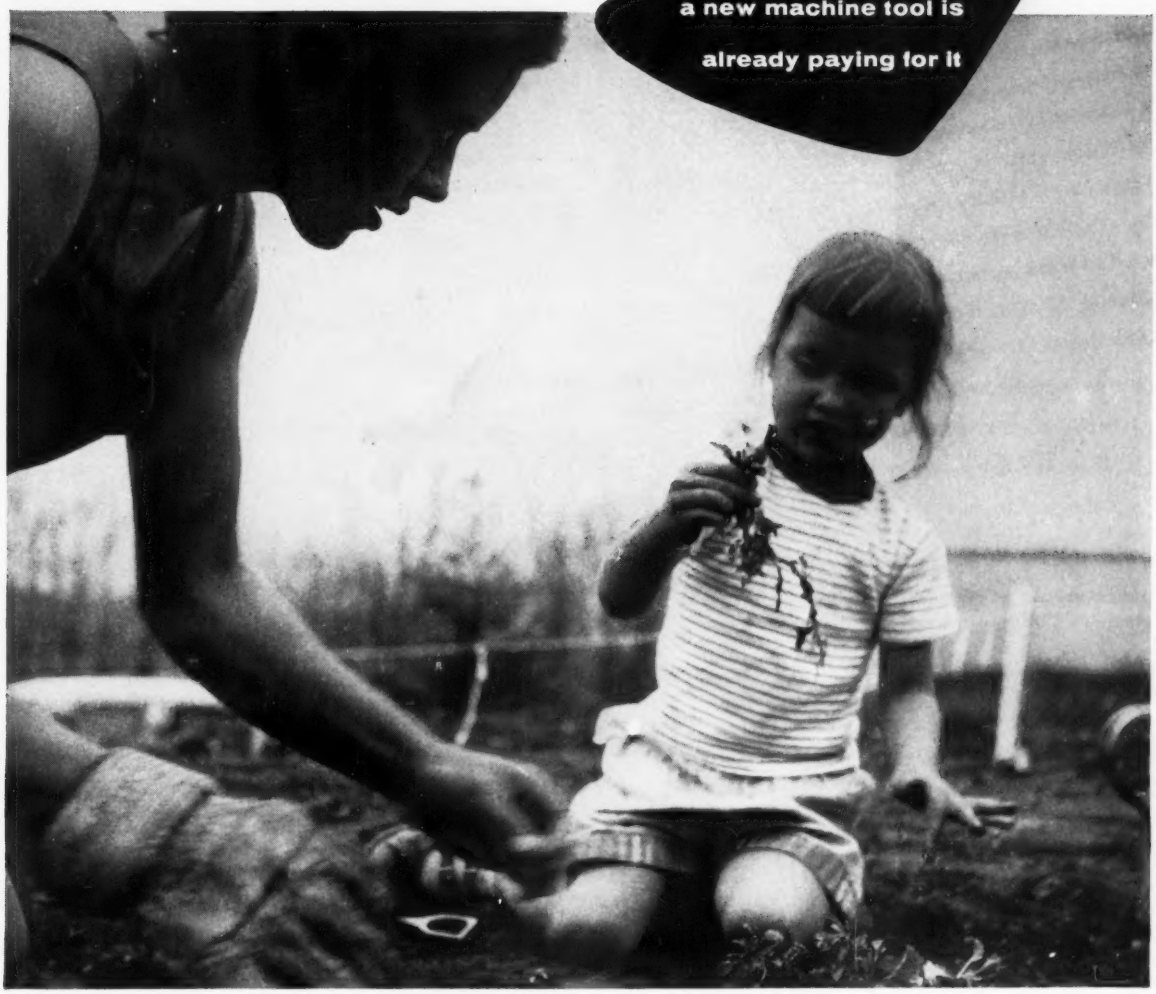
Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.

KAISER ENGINEERS engineers—contractors
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D. C., Buenos Aires, Calcutta, Montreal, Rio de Janeiro, Sydney, Tokyo

JONES & LAMSON MACHINE COMPANY

the man who needs a new machine tool is already paying for it



Spring planting...1949

Just ten short years ago, but a lot of changes have taken place.

Except for Mother, who is every bit as attractive, nothing has remained the same. The garden is now long-established and flourishing, and Daughter is entering college in the fall.

In Dad's shop, things are quite different, too. Labor rates, prices of raw materials and overhead have kept climbing constantly.

Those once-new machines are still running O.K., and seem to have plenty of usefulness left in them. The big hitch, though, is that their performance standards were based on the costs of *ten years ago*. With today's increased costs, the *profitability* of these machines is in serious doubt.

The cost analyses Dad is now completing show very clearly that successful production under *today's* conditions requires *modern* equipment. He used J & L's new "Avoidable Costs" Replacement Formula. It's simple, clear cut and realistic, and avoids the fallacies found in other replacement formulas.

Write for your copy.

Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

Use your AIM*...Simplicity Engineering does...

Steel Strapping cuts 4 hours off bracing time

Acme Idea Man Harold Schultz helps many companies develop better shipping and packaging methods.

SIMPLICITY ENGINEERING, INC., DURAND, MICHIGAN builds specialized screens, feeders, conveyors and shake-outs. In-transit security of these heavy products (up to 11 tons each) was a major concern until their Acme Idea Man helped them develop an Acme Steel Strapping technique that reduces work and assures safe transit. (Idea No. U2-6)

In addition to providing lading security, the use of heavy-duty steel strapping for tie-downs gives added benefits: cars are now loaded, braced and secured in 4 hours less time than formerly needed; material costs are reduced; and loading crews find the job easier.

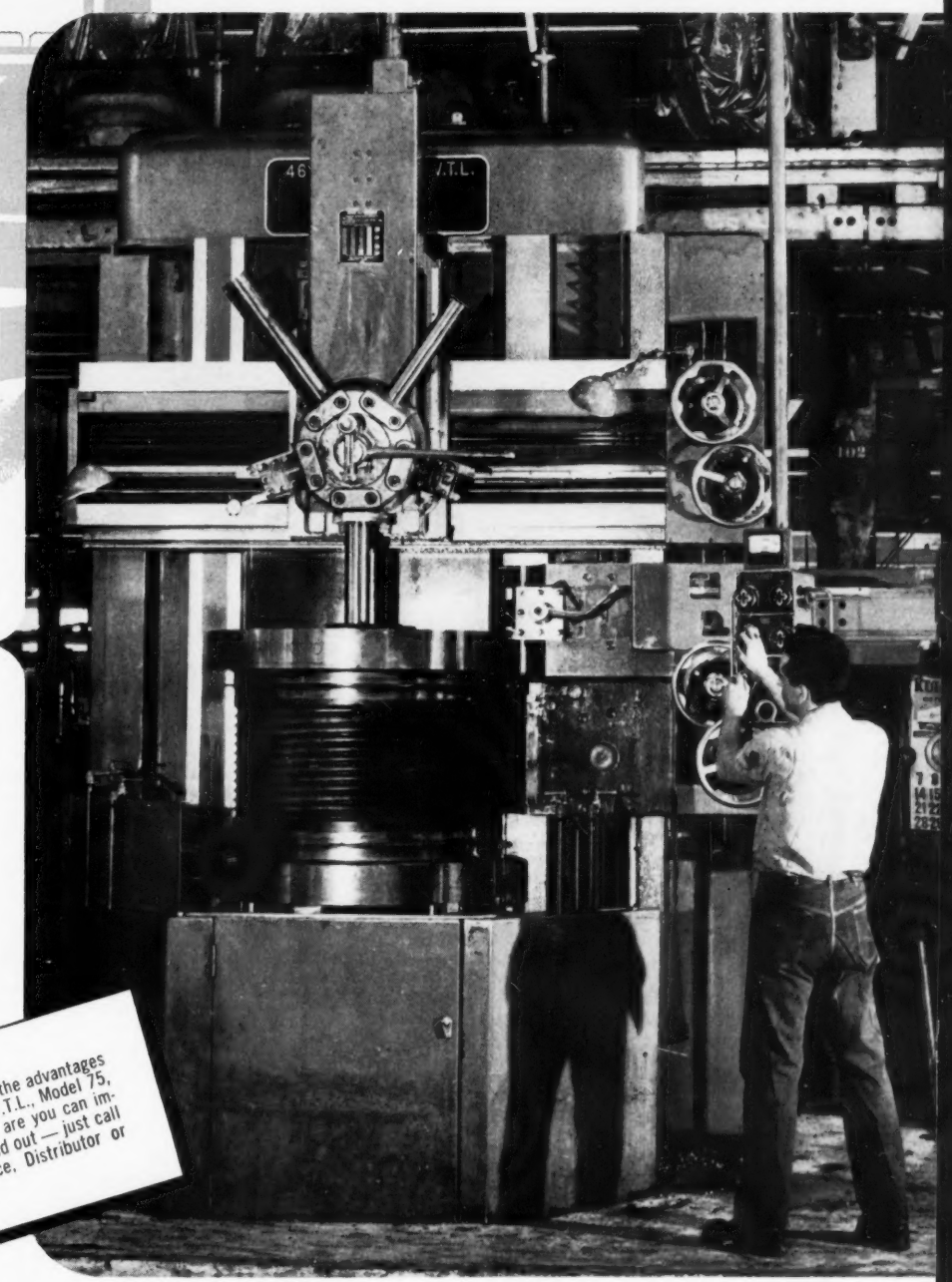
***Use your Acme Idea Man.** He will work with you toward improved packaging and shipping methods. Call him at your nearest Acme Steel Office, or write Dept. SDU-79, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Limited, 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

It Pays To Replace

An analysis of cost records at Philadelphia Gear Corporation, Philadelphia, Pa., shows, according to Mr. John Walker, Shop Foreman,

"A savings of up to 30% in overall production over our older 42" Bullard V.T.L. with our 46" Cut Master V.T.L., Model 75."



This saving is accredited to the following built-in features of Cut Master, Model 75:

Greater rigidity and solid construction – allows heavier cuts.

Greater accuracy with accurate finishes – reduces spoilage.

Simultaneous cutting with turret and side head – reduces machining time.

Ease of operation with Pendant Control – reduces operator fatigue.

Low maintenance cost – less down time.

One shot lubrication system – assures adequate oil to all parts of the machine.

BULLARD

Unless you are now employing all of the advantages offered with a Bullard Cut Master V.T.L., Model 75, to your machining jobs — chances are you can improve your production. Why not find out — just call your nearest Bullard Sales Office, Distributor or write

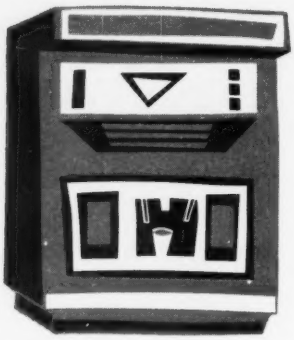
4,000 pound Drum for gate hoist which is bored, faced and turned on 46" Bullard Cut Master V.T.L., Model 75.

THE BULLARD COMPANY BRIDGEPORT 9, CONN.

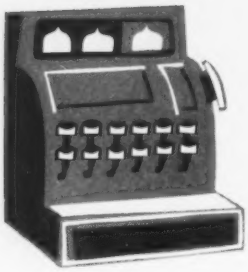
Looking for a bright idea for your product?

HOME APPLIANCES

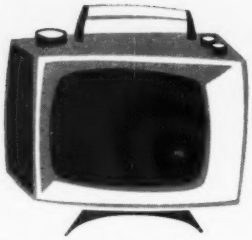
LOOK TO BROWN LIPE CHAPIN



VENDING MACHINES



BUSINESS MACHINES



MUSIC & COMMUNICATIONS

An experienced source of decorative and functional die castings and stampings!

Consider Brown-Lipe-Chapin when you're planning ways of adding "hard sell" to your product. Brown-Lipe-Chapin, with extensive facilities for die casting, metal stamping—including steel and aluminum, and electroplating, can help give your product distinctive new eye appeal with a new dimension in durability.

YOU GET A CREATIVE APPROACH

Brown-Lipe-Chapin, experienced in providing the mass-consumer field with quality bright work, takes a creative approach to your design problems. An experienced staff of engineers work out the best and most economical method of producing your parts.

YOU RECEIVE CONSTRUCTIVE ASSISTANCE

You can count on Brown-Lipe-Chapin for constructive suggestions that often add up to savings in time and money. They'll tackle your most difficult part . . . even if it's up to six feet in length. And complete facilities for die casting, steel or aluminum stamping, anodizing, electroplating and painting are all under one roof.

YOU BENEFIT FROM RELIABILITY BY BROWN-LIPE-CHAPIN

You're assured of reliability with Brown-Lipe-Chapin . . . *reliability* in step-by-step quality control, work performed by craftsmen who are experienced in meeting the rigid specifications of the automotive industry . . . *reliability* in meeting your delivery schedules right on time . . . *reliability* in facilities that can be quickly converted to model change-overs . . . and *reliability* as a continued source of supply. Brown-Lipe-Chapin will guarantee to supply your requirements for die casting and stamping for as long as you may want to specify.

Brown-Lipe-Chapin's two plants, in Syracuse, New York and Elyria, Ohio, combine 25 acres of modern plant facilities that are ready to go to work for you now. So, before the die is cast on your product designs, contact Brown-Lipe-Chapin, Division of General Motors Corporation, Syracuse, New York.

GM GENERAL MOTORS

RELIABILITY by BROWN·LIPE·CHAPIN

DIVISION OF GENERAL MOTORS CORPORATION

Two of Three Continuous Galvanizing Lines at Inland Steel Company, Indiana Harbor.

Continuous Processing Lines

CONTINUOUS GALVANIZING

ELECTROLYTIC TINNING

CONTINUOUS ANNEALING & NORMALIZING

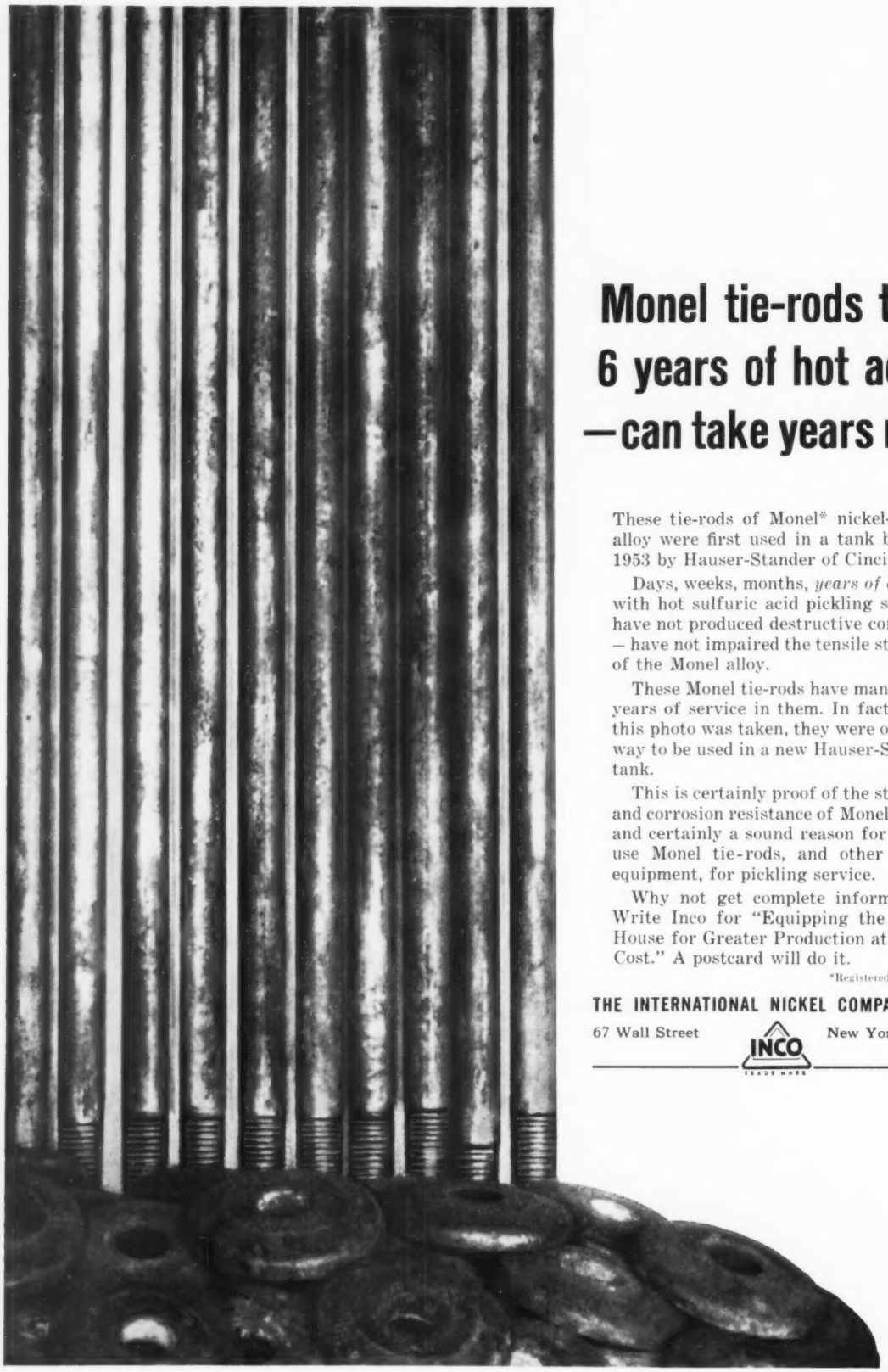
Our experience with Processing Lines dates back to the earliest production of strip in coils. This experience includes the design and building of many Continuous Electrolytic Tinning and Continuous Annealing and Normalizing Lines. In the field of continuous galvanizing, we have built more lines than all manufacturers combined.

In these days of higher and higher speeds, combined with larger coil diameters and weights, equipment must be rugged to stand up to 21-turn operation without long maintenance shutdowns. A trademark of Aetna-Standard is . . . good engineering and ruggedness of equipment.

BLAW-KNOX

BLAW-KNOX COMPANY

Aetna-Standard Division
Frick Bldg., Pittsburgh, Pa.



Monel tie-rods take 6 years of hot acids —can take years more

These tie-rods of Monel* nickel-copper alloy were first used in a tank built in 1953 by Hauser-Stander of Cincinnati.

Days, weeks, months, *years of contact* with hot sulfuric acid pickling solution have not produced destructive corrosion – have not impaired the tensile strength of the Monel alloy.

These Monel tie-rods have many more years of service in them. In fact, when this photo was taken, they were on their way to be used in a new Hauser-Stander tank.

This is certainly proof of the strength and corrosion resistance of Monel alloy—and certainly a sound reason for you to use Monel tie-rods, and other Monel equipment, for pickling service.

Why not get complete information? Write Inco for "Equipping the Pickle House for Greater Production at Lower Cost." A postcard will do it.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street — New York 5, N.Y.

INCO
TRADE MARK

INCO NICKEL ALLOYS

STEEL

Metalworking Outlook

July 20, 1959

The Strike that Nobody Wanted

From the beginning of steel labor negotiations on May 5, the route to a peaceful settlement seemed clear. Industry would exchange a modest wage increase for removal of contract clauses that lead to featherbedding. Result: A noninflationary settlement from which both labor and management would benefit. But David McDonald wanted a billion dollar bundle—he advertised it, promised it, demanded it. Industry said "No." After 2½ months of bargaining, the union had retreated slightly; management stood firm in its demand for a noninflationary settlement. The strike was on. There's little enthusiasm for a walkout. It's costly for everyone. The longer a walkout lasts, the greater is the number of people who are hurt. Most signs point to a lengthy walkout. The strike that nobody wanted may even slow a young, healthy, and fast growing boom (Pages 47, 48, 49).

Steel Employment, Payroll Costs Set Records

Employment in the iron and steel industry in May totaled 634,658—highest since April, 1957, and up 26.8 per cent from May, 1958. More than 14,000 employees were added during the month, reports the American Iron & Steel Institute. Two monthly records were set: Average hourly payroll cost of wage earners rose to $3.346 (excluding pensions, SUB, social security, and insurance which cost an extra 33.2 cents an hour in 1958). The industry's total payroll cost climbed to $396.9 million in May.

SUB: What Labor, Management Want

Both labor and management view Supplemental Unemployment Benefits as an interim measure in the quest for job security. But each has a different goal in mind. Labor looks upon SUB as a step toward a guaranteed annual wage. Management hopes to use it as a device to guarantee employee loyalty to the company. Few big changes are expected in the near future, but you can expect a severance pay provision to be tacked onto many SUB plans (Page 62).

Chance for Labor Reform; You Can Help

Odds still favor the passage of some kind of labor reform bill by Congress this session. The House Labor Committee is working behind closed doors

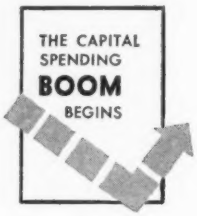
on a measure of its own. Now is a good time to write your congressman about your view on the issue to prepare him for the upcoming debate when the bill reaches the House floor.

Russia's Kozlov Sees U. S. Mills

In his tour of the U. S. this month. Frol R. Kozlov, first deputy premier of Russia, visited three steel plants, boasted repeatedly that he is a metallurgist, and claimed that he once operated a blooming mill. He appeared to understand the steelmaking operations he was shown.

More Presses Will Be Purchased

Look for sales of presses to the metalworking industries to be 11 per cent higher in the coming six months than during 1959's first half. It signals a $102 million year for the press industry. Top buyers will be the auto industry and electrical machinery and equipment industry (Page 53). This report is the second in a new STEEL series on the outlook for capital spending.



Material Handling Equipment Orders Strengthen

The dollar volume of new orders for material handling equipment in May rose 11 per cent above that for April, reports the Material Handling Institute. It's the best month since August, 1956. The second half of 1959 could bring a new record; STEEL's new capital equipment spending survey (STEEL, July 13, p. 56) shows that metalworking will boost outlays for handling equipment 28 per cent in the second half.

Are Too Many Tests Hurting Welding?

Yes, says James F. Lincoln (picture), chairman, Lincoln Electric Co., Cleveland. Many other authorities told STEEL the same thing. They say users should modify the indiscriminate use of nondestructive tests with some horse sense. Welding can be used, at substantial cost savings, in many applications where it's not now considered because of suspicion resulting from many tests. Overdesign can cause the use of costly—and unnecessary—tests, the experts believe. But there's no clearcut answer. STEEL got views on both sides (Page 84).

What We Need to Keep Air Supremacy

Aerospace Industries Association has compiled a list of scientific changes the U. S. will need in the next decade to maintain air supremacy. Included:

1. A marked increase in the use of inertial guidance and control systems. 2. Development of reliable, gas lubricated, spin bearings. 3. Higher density metals (AIA predicts more weldments, fewer castings will be used). 4. Greater use of etch, blast, and ultrasonic cleaning. 5. Wider adoption of automation and numerical control. 6. New standards of quality control and data evaluation. 7. Closer tolerances. 8. Carefully controlled atmospheres for brazing, welding, and heat treating. 9. Use of ceramic adhesives. 10. Commonplace acceptance of bonding steels. 11. Machining with superheated tools in subzero temperatures. 12. Adoption of ultrasonic and electric discharge machining. 13. Development of complex testing equipment that is easy to operate.

Canada's Recovery Gains Strength

Keep your eye on Canada as a growing market and rebounding competitor. The country is showing signs of vigorous economic expansion, reports the National Industrial Conference Board. Examples: The Canadian index of industrial production rose (on a 1959 base, seasonally adjusted) from its December, 1957, low of 148.6 to a record 160.9 in February, 1959. Mining production and electric and gas output also hit records in February. Durables manufacturing, which accounts for nearly half of all Canadian manufacturing output, rose ten points in the five month period to February. Personal income set a record.

Urge to Merge Still Strong

A preliminary tabulation of mergers during 1959's first half by the Federal Trade Commission shows the rate is continuing high: 521 were recorded during '59's first half compared with 443 in '58's like period and 462 in the first half of 1957.

J&L Offers Application Aid

You can often get free aid on the use of a material or product from the firm that sold it to you. Jones & Laughlin Steel Corp., for example, maintains a staff of service metallurgists who help customers select the right steel, and advise them on its use (Page 50). Frank Masterson (left in picture) shows a customer how to bend alloy steel plates to make parts for iron ore transfer equipment, and tells the manufacturer where he can get the job done. You may want to offer such aid yourself.

Where Coal Production Is Headed

Expect production of bituminous coal to reach 500 million tons in 1963, says R. E. Salvati, president, Island Creek Coal Co., Huntington, W. Va. U. S. production last year: 405 million tons. Mr. Salvati says electric utilities will use 34 per cent more coal in '63; their share of total production will

climb from 37 to 45 per cent. The steel industry, coal's second largest customer, will use 43 per cent more. Other industrial uses will rise 13 per cent. Retail deliveries will drop about 15 per cent. Exports to Canada will drop from 14 million tons this year to about 12 million tons in '63, believes Mr. Salvati.

Carriers Bid to Keep Cars Moving

Many railroads, plagued by a shortage of freight cars, are asking Congress to allow them to raise their per diem charge. Presently $2.75, they want to boost it to force terminals to free the cars quicker. The terminal roads are fighting the effort; western roads generally favor it. The Interstate Commerce Commission is backing the move (Page 56).

Lead Seeks Bigger Antivibration Market

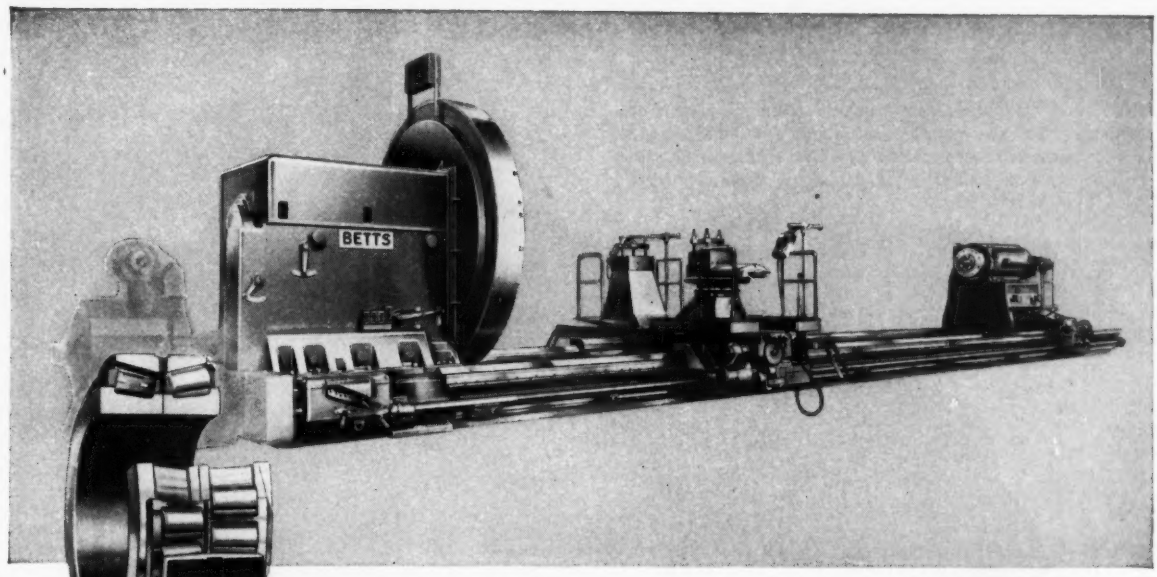
The Lead Industries Association will begin an extensive research project to develop engineering data on the use of lead to control vibration in machinery and buildings. Combination lead-asbestos pads are now used to prevent transmission of vibration from railroad tracks to buildings. Some machinery is installed on the same kind of pads.

$171 Billion for Water

To keep abreast of population growth and industrial expansion, the U. S. will have to invest $171 billion in water source development by 1975, estimates the Commerce Department. It means spending about as much in the next decade and a half as has been spent in the last 17 decades. Investment in water resources now represents 10 per cent of the national wealth or $1028 per capita.

Straws in the Wind

In one month (on Aug. 18), the United Rubber Workers start negotiating with Goodyear Tire & Rubber Co., under a wage reopener clause . . . The tightening money market is pinching some metalworkers . . . Dobeckmun Co., a division of Dow Chemical Co., cut prices 8 to 10 per cent on polyethylene bags . . . President Eisenhower signed into law a three year extension of the Renegotiation Act . . . U. S. exports of typewriters have dropped to 8 per cent of the world market from 63 per cent a decade ago . . . Weirton Steel Co. set an ingot production record in the first half . . . Susquehanna-Western Inc. will buy around $15 million worth of uranium ore from Vitro Minerals Corp. for processing at Riverton, Wyo. . . . Hertz Corp. will buy 4500 compact cars this fall when the Big Three put their Three Littles on the market . . . Consumer durable spending looks like it will top all previous records, capital spending will rise considerably in the coming year, says University of Michigan's Thomas Gies.



from machine tools... to hand drills

Torrington makes the right anti-friction bearing for every basic need!

In a huge lathe, the need may be for a five-foot diameter Torrington Tapered Roller Bearing, precise to a few ten-thousandths of an inch. In a hand drill, it may be for a compact Torrington Needle Bearing, fractions of inches in diameter for light weight and easy handling.

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After 17 years of outdoor service there's no rust on this fence charger case made of ZINCGRIP PAINTGRIP. Dark areas are remnants of original paint that weathered away in sun and rain. Small photo shows complete new charger before painting.

New steels are born at Armco

17 Rust-Free years for Fence Charger ...thanks to Armco ZINCGRIP PAINTGRIP

There's no sign of rust on this fence charger case after more than 17-years' outdoor service on a midwestern farm.

"This is typical of the long life these cases have given our customers since we first standardized on Armco ZINCGRIP® PAINTGRIP® Steel in 1940," says an official of Parker-McCrory Manufacturing Company, Kansas City, Missouri.

Workable—Paintable

"These cases require a deep draw," adds the official, "but we've never had trouble with flaking or peeling of the zinc coating. What's more, paint holds tight, even though we apply it right after fabrication without any special surface preparation."

Remember: Armco ZINCGRIP PAINTGRIP Steel is zinc-protected and workable. Important too, its surface is specially prepared for painting before it leaves our mill. If you'd like to know more about the ways it can help *you* sell products and save money, just fill in and mail the coupon.

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What the Labor Dispute Means

Ten weeks of wrangling between the United Steelworkers of America and the Steel Companies' Coordinating Committee demonstrates once again the need for realism in labor negotiations.

In sparring for position last week, the major issues boiled down to these:

1. Management wanted to eliminate the cost of living clause that cost the steel industry 17 cents an hour during the 1956-59 contract. Labor wanted it left in.

2. Labor wanted a wage package so large it would have sent the economy off on another round of inflation. Management was willing to go along with improved pension and insurance benefits in the first year of a two year contract and a modest wage increase the second year.

3. Management wanted changes in work rules that would eliminate featherbedding and make it easier for the steel companies to launch cost cutting programs. Labor made only a token gesture in this direction.

4. Management wanted to tighten controls over wildcat strikes by deducting one day of vacation for each day a man walks off the job. Labor now gives only lip service to the rule that a wildcat striker can be fired.

Differences dragged out for so many weeks make no sense.

Labor knows that in the long run it cannot wring wages and benefits out of the industry beyond its ability to pay, that it cannot expect pay for work not performed, and that sooner or later it must acknowledge the need for improved technology.

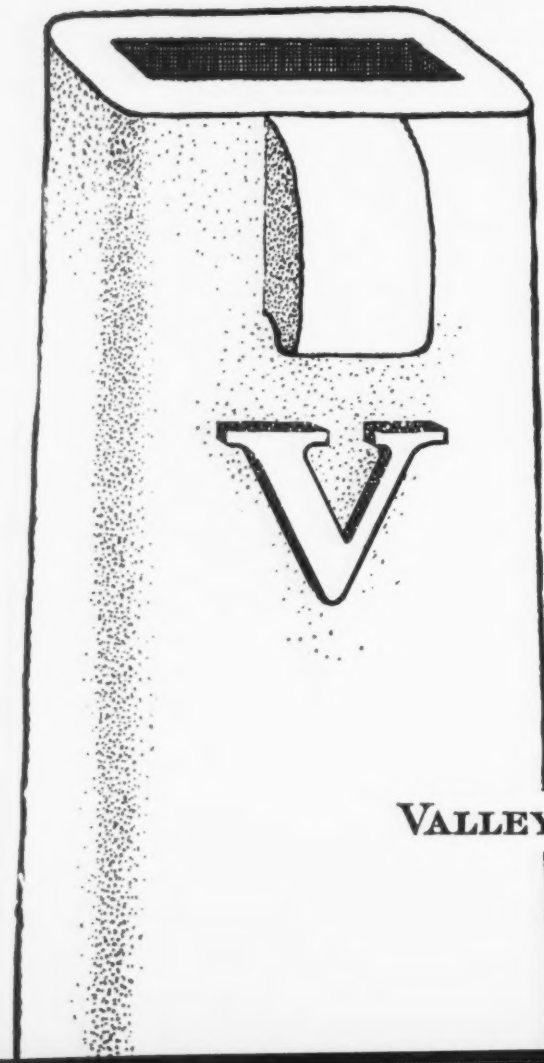
Management knows that it must share the benefits of improved technology and profitable business with the workingman as well as the owners of the business.

Unless labor and management can somehow work out procedures to settle their differences on a rational basis, it means one thing:

Forced arbitration under government control that nobody wants.

Irwin H. Such

EDITOR-IN-CHIEF



Tomorrow

we'll harness the energy of the sun . . . . .

but even then

steel will be poured into

VALLEY INGOT MOULDS

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

Who Pays For It?

LOST WAGES:

$ 10,400,000

Every Day

LOSS TO COMPANIES:

$ 42,000,000

Every Day

LOST PRODUCTION:

283,100 Ingot Tons

Every Day

Based on operating at 70% of capacity during third quarter had there been no strike.

The Strike That Nobody Wanted

It came anyway, as STEEL repeatedly predicted. It'll be costly. Most steel users were set for it, but it will still strike a damaging blow to many segments of the economy

BILLION dollar bundle: That's Dave McDonald's asking price. He said so early in the year and people thought he was kidding. On July 14 he made it crystal clear: It was billion dollar bundle or bust. Industry didn't cave in, so Mr. McDonald's United Steelworkers hit the bricks for the sixth time in the last 13 years. It was a strike that nobody wanted.

The USW liked its 1956 contract so well that it's asking for a second helping. There can be little doubt that it adds up to $1 billion. Mr. McDonald himself estimates that the last labor settlement cost the industry 45.6 cents per manhour, plus 17 cents in cost of living adjustments. He admits to 62.6 cents but makes no allowance for a 30 per cent rise in the cost of other benefits (paid holidays, vacations, pensions, insurance) that are affected by changes in base rates. Industry accountants put the three year cost at 81 cents per manhour.

If 500,000 men get a raise of 27 cents an hour and each works 2000 hours a year, the cost to industry is $270 million. In two years, it's $540 million; in three, $810 million. And that's just for basic steel. If the rest of Mr. McDonald's 1.25 million members (in fabricating, foundry, and nonferrous industries), get comparable increases, the over-all cost for three years would be more than $2 billion.

• **Industry Takes Initiative** — Although he knew full well that steel management was dead set against any repetition of the 1956 bargaining debacle, Mr. McDonald demanded a big package. He ticked off more than 250 proposals, eventually boiled them down to request for a wage increase and "substantial" improvements in weekend premiums, vacations, pensions, insurance, hospitalization, and Supplemental Unemployment Benefits. R. Conrad Cooper, chief negotiator for the industry, countered with a proposal aimed at halting the inflationary spiral: Industry would "continue present wages and benefits unchanged" until June 30, 1960.

When the union rejected the offer

"out of hand," Mr. Cooper came back with an eight point program for reducing waste, increasing efficiency, and "generating new economic progress." As STEEL had predicted (Apr. 27, p. 54), the principal aims were these:

1. Modification of Section 2-B, the clause that makes it almost impossible for management to change established (and often inefficient) work practices.

2. More safeguards against wildcat strikes.

3. Elimination of the cost of living clause. (Mr. Cooper called it "self-defeating." Said it fed inflation instead of protecting against it.)

4. Employment cost increases limited to no more than increases in real productivity.

Although industry promised no wage increases, the implication was clear enough: Concessions by the union would enable management to raise wages moderately without hiking prices.

• **McDonald Hits Back**—Bitterly denouncing Mr. Cooper's second offer as a scheme to "enslave our members in industrial peonage," Mr. McDonald declared that steelworkers aren't guilty of featherbedding and that the USW has never resisted technological progress, but when he was asked how much the industry might save if its proposals were adopted, he estimated "an absolute minimum of a couple dollars an hour per man. A probable side effect," he added, would be "to remove as many as 100,000 steelworkers from the industry in the next year or two."

As the once postponed strike deadline neared, industry made a third proposition: It would boost insurance and pension benefits during the first year of a two year agreement and grant a modest wage increase in the second if the union would agree to contract changes which would offset the increased costs. Nothing doing, said Mr. McDonald. The USW wanted a straight renewal of the 1956 pact. At the last minute, the union leader offered a "concession" on contract language. He'd write this sentence into the local practice clauses of all steel contracts: "The provisions of this section are not intended to prevent the company from continuing to make progress." Mr. Cooper wasn't impressed. The talks ended. The strike was on.

• **Union's Strategy**—Setting a stellar example, Mr. McDonald hurried down to U. S. Steel Corp.'s Fairless Works to organize the strikers. But there didn't seem to be much enthusiasm for the walkout. In Pittsburgh, the picketing was light.

"The union is striking because it feels it must," says a USW insider. "Anytime it's offered less than it sets out to get, strategy dictates a walkout. After a while, McDonald will say to his boys: 'This is the best I can do. Do you want to go back to work?' Nobody will complain too much if the strike doesn't last more than six weeks. In the end, McDonald may not get any more than he could have had on July 14, but he'll claim a victory. He'll remind everybody that the companies wanted him to accept a one year freeze."

• **Is This Strike Necessary?**—From the start of negotiations (May 5), the route to a peaceful settlement was clear. Both sides were on the spot, so neither could expect total victory. Industry negotiators had to resist higher employment costs because they were battling inflation and the inroads of foreign steel. Mr. McDonald had to get something because rivals for the USW presidency are just waiting for the day when they can ask: "But what have you done for us lately?"

• **Impact on Economy**—To most observers, loss of pay will be the most noticeable strike damage. Unless the walkout lasts longer than six weeks, total industrial production will dip less than 2 per cent. Gross national product, perhaps the broadest business indicator in common use, will continue to expand during a six week strike, although perhaps not as much as during a non-strike situation. Economists feel that it would take at least an eight week strike to hold GNP for the third quarter at the second quarter annual rate. Regardless of the length of the strike, they see GNP climbing to an annual rate of nearly $500 billion in the fourth quarter.

In spite of the strike, 56 steelmakers with 13 per cent of the industry's capacity are open for business. Some are unorganized, some have independent unions, some have USW contracts that don't expire for a while, and some (like Granite City Steel Corp.) have been given extensions. Largest of the operating companies are Weirton Steel Div., National Steel Corp., Armco Steel Corp. (Middletown, Ohio, and Butler, Pa.); Ford Motor Co.; Wisconsin Steel Div., International Harvester Co.; Granite City Steel Co.; Detroit Steel Corp.; Lone Star Steel Co.; Alan Wood Steel Co.; Lukens Steel Co.; Copperweld Steel Co.; Laclede Steel Co.; Empire-Reeves Steel Corp., subsidiary of Universal-Cyclops Steel Corp.; and Keystone Steel & Wire Co.

• **Inventories in Good Shape**—Since the first of the year, steel users have boosted their inventories from 13 million to 21 million tons. Stocks are about 4 million tons lower than they were on the eve of the 1956 strike, but they're in better balance. Hardly anyone will be hurt for at least a month. Major consumers are well prepared for the walkout. Automakers have enough steel to wind up production of the 1959 models and make a good start on next year's cars. Consumption will be low during the next few weeks because of model changeovers.

Appliance manufacturers are set for 60 to 90 days.

Inventories of steel service centers are at a record 3.7 million tons, says Robert G. Welch, executive vice president of the American Steel Warehouse Association. They've increased by 10 per cent since Jan. 1 and they're 1 million tons greater than they were at the start of the 1956 strike.

If some of the small companies that make parts for the big manufacturers run low on steel, we may see a form of lease-lend. Automakers might ask suppliers who have surplus tonnage to ship metal to venders who are in danger of running out. This would involve the rewriting of supplier contracts, but it might be worth the trouble in a pinch.

In Washington, the Iron & Steel Division of the Business & Defense Services Administration looks for no emergency rulings soon. (In 1956, BDSA froze warehouse stocks on the sixth day of the strike.) The agency has no way of knowing

where spot shortages will develop, but it foresees no limitations or priorities in the near future. The Defense Department says fabricators have ample inventories but warns of potential trouble on specialty items for the space and missile fields. In some cases, engineering hadn't progressed enough for contractors to know what their requirements would be.

• **Enter Uncle Sam**—The Federal Mediation & Conciliation Service lost no time in offering a helping hand to steel labor and management. Joseph F. Finnegan, director, met with the industry team at 4 p.m. on July 15 and with the union team at 5:30. Mr. Finnegan and his aides are well aware of the issues. They've been talking to both sides informally since December. They'll continue to seek a practical solution.

A source close to the White House tells STEEL that there's nothing to indicate early use of the emergency provisions in the Taft-Hartley Act. To get an injunction, the President has to go to court and offer proof of peril to the economy or national defense. Since it's well known that steel users have big inventories, this would be hard to substantiate until the strike has lasted at least a month. Some mediators are skeptical about T-H. Reason: The 80 day "cooling off" period often becomes a "warm-up."

Who's Hurt by the Steel Strike

"WE MIGHT AS WELL GO FISHING." That's how F. C. Colegrove, executive vice president, Allied Oil Co., a subsidiary of Ashland Oil & Refining Co., describes the effects that the steel strike will have on his firm's residual oil business.

• **More than a Million**—Mr. Colegrove is one of more than 1 million persons outside the steel industry who are affected by the walkout. During the 1952 steel strike, more than 825,000 workers outside the steel industry were made jobless by the walkout, the government reports. Chances are that fewer will be laid off this year. Inventories are high in steel buyers' plants. And mechanization in affected industries has lowered the number of production workers.

• **Railroads**—But the economic impact of lost wages will still be widespread. The Pennsylvania Railroad, for example, furloughed 6200 employees last Thursday. About 20 per cent of its total loadings come from steel business. Other roads will follow suit. The Chesapeake & Ohio Railway expects to lose 5 per cent of its July carloadings due to the walkout; about 10 per cent of potential August loadings will be lost if the strike lingers on.

The Association of American Railroads estimates carloadings will drop about 100,000 cars during the first week of the strike. The figure will rise as the strike continues and could cost the roads $250 million in lost revenue if it lasts two months. During the 1952 strike, 100,000 rail employees were forced out of work.

• **Mining**—More than 35,000 soft coal miners will be affected, even if the strike is settled before it's six weeks old. Iron ore miners also face workless days. Most are organized by the USW. Many say they didn't want a strike, but they'll back it as they have in the past.

• **Merchants** — Mill town shopkeepers are among the hardest hit in any steel strike. Many clothiers, auto salesmen, and operators of entertainment establishments see their volume cut in half immediately, with prospects of it sinking lower as the strike drags on. Many suppliers of essential items, like grocery store operators, are forced to carry their customers "on the cuff."

• **States**—State and local tax revenue is cut by a lengthy strike. Ohio, for example, will experience a drop in sales tax revenue as unemployed workers stop buying durable goods. Minnesota's revenues from iron mining companies (in 1957, it collected $33 million from the firms) will decline, curtailing expenditures for educational facilities.

• **Refractories** — Refractory plants have already felt the strike's impact. Steel mills shut off rail shipments a week before the strike started. There will probably be some stockpiling of bricks and linings and some furnace repairwork will continue during the walkout, but operations will be substantially curtailed.

• **Scrap**—The walkout brought to an abrupt halt the mild price rise in scrap that had been underway for several weeks. Heavy export demand will keep the price index from plummeting immediately, but scrapyard operations will be curtailed, and some scrapyard employees face layoffs.

• **Barges**—Many barge lines have been on strike since July 1. Those not affected by the labor squabble will be hurt by the steel walkout. One such line admits to a volume decline in excess of 50 per cent.

• **Automotive**—Most auto people have enough steel to carry them over a six to eight week strike. Some will find their inventories out of balance after four weeks, but juggling among suppliers will keep the production lines running. Though steelworkers don't account for a major part of the auto industry's new car market, a strike could dampen car sales. One industry researcher says a six week strike could lose 150,000 unit sales because people not related to the strike would have their confidence shaken and adopt a "wait and see" attitude. Some auto suppliers that hoped to have enough stocks to ride out a 90 day strike have failed to hit the goal because of the high production at midyear. One Chicago supplier reports: "Stocks we had earmarked for November will be eaten up in early August, but we'll be O.K. for 60 days."

Supplier Helps Customers; Offers Application Advice

Jones & Laughlin's service metallurgists go into the fabricator's plant to help him select the right steel for a particular use, or solve his application problems

Frank Masterson (left) examines the finish on a cold rolled sheet with H. E. Wohlgemuth, chief inspector at Eaton's stamping division. About 2 per cent of the surface metal has been taken off in a flat polishing machine

ARE YOU taking advantage of all the services offered by your suppliers? Some employ trained metallurgists as liaison men to advise you on the choice of materials and to see that you're happy with past purchases.

Example: Frank Masterson, a service metallurgist with Jones & Laughlin Steel Corp., is ready to solve problems in the fabrication of flat rolled products. His territory: Cleveland and the area within a radius of 100 miles.

• Volume users see Mr. Masterson most often, but he'll drop in to give advice on metalworking where and when he's needed.

The service metallurgist sees that the customer and J&L's mill and sales personnel understand just what's wanted or needed in the material for new products—such as next year's autos or appliances.

Before an order is written, he studies the customer's specifications and the parts he'll make. Steel isn't rolled until its application is checked carefully.

Even after metal is chosen for a job and production is started, the metallurgist returns periodically to see that his company's product is giving satisfactory performance. If it isn't, he keeps mill and sales personnel in his company informed, so improvements can be made.

• Typical day: Visits to a number of plants and solution of several different metalworking problems.

It's up to Mr. Masterson to recommend the best steel for each job and help the customer keep material costs in line.

Each fabricator has his own rules for selecting steel. If the metal is to be formed, it has to be ductile. If it's to be used in sheets or panels, flatness is important. If it's to be plated, it must have a superior surface finish.

Other applications require special emphasis on strength, formability, and resistance to corrosion or abrasion.

• Typical call: A trailer builder wants to make body walls thinner and lighter for greater payload. The metallurgist helps by recommending steel of the right structural strength.

Thinner, stronger walls are made at the Avon Lake, Ohio, plant of Fruehauf Trailer Co., by using high tensile steel for posts and crossmembers.

Three, high tensile grades are available from Frank Masterson's company. The one originally used at Fruehauf to make hat sections (structural parts) had high strength and corrosion resistance. But it was hard to form, says Don Bates, purchasing agent. It had a tendency to crack when a sharp radius was made on a press brake or roll forming machine.

Mr. Masterson suggested another grade that has better ductility and meets specifications for tensile strength and corrosion resistance. Result: Fewer rejects and less welding.

• Mechanical properties for stamping jobs differ; the surface is guar-

anteed, even after some stock is removed.

Steel that's to be deep drawn, polished, and chrome plated at Eaton Mfg. Co., Stamping Div., Cleveland, passes through a flat polishing machine, where 2 per cent of the surface metal is taken off before it goes to the blanking presses.

Frank Masterson advises the customer whether to use aluminum killed (nonaging) steel; in some cases, he recommends replacing the aluminum killed grade with rimmed steel.

Eaton buys premium grade, cold rolled sheets to insure good ductility and a superior finish on the exposed surface. The company rates all suppliers on product performance. Mr. Masterson checks results of surface and drawability tests with H. E. Wohlgemuth, chief inspector, to see that his company's sheets are performing satisfactorily.

• When an application requires more than ordinary wear and impact resistance, the metallurgist recommends a suitable grade of steel; he often helps with fabrication problems.

Ore transfer equipment at Union Dock Co., Ashtabula, Ohio, a subsidiary of Jones & Laughlin Steel Corp., has to stand severe abrasion. Bottom trays of Hulett unloader buckets, cast of premium grade manganese steel, were wearing out in two years, says Gordon Johnson, master mechanic.

Frank Masterson's company had supplied a special alloy steel for some applications at the dock. Example: Bottom plates in ore hoppers that receive 17 tons a throw from the Hulett buckets. The parts had lasted three years. The heat treated alloy steel did such a good job that Mr. Johnson wants to use it wherever possible.

He found that the particular grade of alloy steel he had on hand was hard to form because of its thickness and toughness. He asked for advice on bending the metal to make unloader bucket trays. They cost $3000 a pair when cast of premium grade manganese steel; made of alloy steel, they might cost only half that, and they'd wear longer.

Mr. Masterson pointed out that the alloy steel could be furnished in various hardness ranges and recommended one for the job. Realizing that heavy equipment would be needed to bend the heavy alloy steel plates (they should be cold formed, if possible, to retain abrasion characteristics), Mr. Masterson also recommended a fabricator who had the right equipment and know-how to make the trays.

• The service metallurgist has authority to deal with the customer when steel quality is questioned.

Sometimes Frank Masterson suggests a change in fabricating technique that improves performance. In one case, too much oil on coiled steel made it behave poorly in the stamping dies. Solution: Use less oil.

On rare occasions, a coil fails to meet requirements. The metallurgist negotiates a settlement that's fair to his company and to the customer. If possible, the material is applied to less critical uses. When such application isn't possible, Mr. Masterson arranges for proper disposition of the coil from the customer's plant.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Steve Phillips, a production control man at Fruehauf Trailer Co., learns which high tensile steel is best for floor hat sections. The metal has to be ductile, so it can be formed on a press brake or roll forming machine

Industrial Gem Sales Up

Sales of industrial diamonds in the second quarter of 1959 reached more than $19 million; up 113 per cent from the 1958 period. A growing demand for industrial stones, particularly in the American market, is reported by the Central Selling Organization for African Diamond Mines.

Natural diamonds have become more plentiful in the last year with the expansion of mining operations in the Belgian Congo and other districts of Africa. Since many of these deposits produce few gem-quality diamonds, their development has become practical only with increased demand for industrial stones.

Plans Aluminum Tower Use

A high voltage electric power transmission line with all aluminum towers will be built by Philadelphia Electric Co., Philadelphia. The firm joins Public Service & Gas Co., Newark, N. J., and Commonwealth Edison Co., Chicago, in using aluminum towers. The line, using 20 towers to join PE's Chichester, Pa., substation with its Delaware River crossing at Chester, Pa., will be put in service by mid-1960.

New Air Pollution Controls Coming?

SWEEPING CHANGES in industrial zoning laws were recommended at the annual meeting of the national Air Pollution Control Association.

If adopted, they could result in a new round of legal opposition to operation of your present facilities, as well as plans for expansion and new plants.

If you think existing plants could not be affected, listen to what the experts of the Los Angeles County Air Pollution Control District have to say: "Depending on the situation, air pollution zoning could be exercised to prohibit new industries, limit expansion of existing industries, liquidate nonconforming industries after amortizing their existing investment, or eliminate harmful industries immediately."

• **County-Wide Plan**—The Los Angeles researchers told the association of a proposed Metropolitan Industrial Zoning Plan (MIZ) which would establish plant zoning laws for an entire county, and would be binding on all political subdivisions within the county. (In Los Angeles, this would regulate all unincorporated areas of the county as well as 63 separate incorporated cities.)

Basis for MIZ would be a formula for determining the maximum permissible air pollution in the last downwind zone of the area, and upwind zones would be limited in industrial concentration accordingly. The MIZ plan takes into account the fact that even if all area industry is equipped with pollution control devices, the residual emission from all the controlled sources will still produce a cumulative effect, known as "area source."

• **Legal Sanctions**—"The sufficiency of supporting data and expert opinion would be the main problem anticipated as far as legal sanction for the zoning program is concerned. That legal obstacles would not interfere was the opinion of the Los Angeles county counsel, provided the air pollution zoning regulation was based on rational grounds," reported the L. A. group.

• **Where Does It Come from?**—One preliminary to setting up an MIZ plan would be an analysis of the area's pollution sources and the movement of pollution particles in wind direction, trajectory, and concentration. Studies like these resulted in recent findings that auto exhausts were Los Angeles' prime pollutants. The studies showed that no other source of hydrocarbon emission could explain measured pollution because "the air just did not travel over refining sections, for example, but did travel over high density traffic areas."

Los Angeles' researchers told the association that at least one experiment in setting up such a controlled zone had failed, to date, but indicated that refinements would make the system possible.

Berlin Businessmen Have Big Problems

THINK you have troubles? Berlin businessmen must always be on the alert for political crises. To avoid being caught unprepared, they operate with two aims in mind: 1. Be totally flexible. 2. Be in the best possible cash position at all times.

Long range planning has been impossible in this politically uncertain area for ten years. For the manufacturer, this means a hesitation to make long term commitments or to tie up large investments in plant expansion, heavy machinery, and raw materials.

The wholesale and retail distributor resists building inventories. But Berlin outlets must turn over inventories more often than their West German counterparts. The Bonn government and German state governments, aware of these problems, have insisted that priority be given orders from Berlin suppliers. The Bonn government also gives financial help in short term credits.

The entire financial workings within the Berlin business community have been, and probably will continue to be, handicapped by widespread emphasis on maintaining liquid assets. Long range credit arrangements are rare in proportion to the size of transactions.

But private investment continues mainly for 1959-60 construction.

Reynolds to Develop Rich Aussie Bauxite

REYNOLDS METALS CO., Richmond, Va., has secured control of what are reported to be the richest bauxite deposits in the Southern Hemisphere. They are near Weipa, Queensland, Australia, on the west coast of the Cape York Peninsula.

Since the discovery of bauxite there in 1955, an Australian firm, Commonwealth Aluminum Corp., has spent over $3 million gathering basic information about the region (plans, surveys, tests, and mineral supply and geologists' reports). Reynolds gained control when it took over Commonwealth's parent company, British Aluminum Co. Ltd., London, after a $40 million deal on the London stock market.

• **Problems**—Weipa is in a sparsely settled and undeveloped region of the continent. Linking the city with outside sources of supply, particularly the provision of harborworks, could cost as much as $10 million even before an ounce of ore is mined. A detailed survey of port sites is underway.

Other problems: Providing power, water, sewerage systems, communications, and transportation. Hydroelectric power may be used in the project.

Reynolds is also expected to buy into the Bell Bay aluminum plant in Tasmania, now a Tasmania-Australian government enterprise.

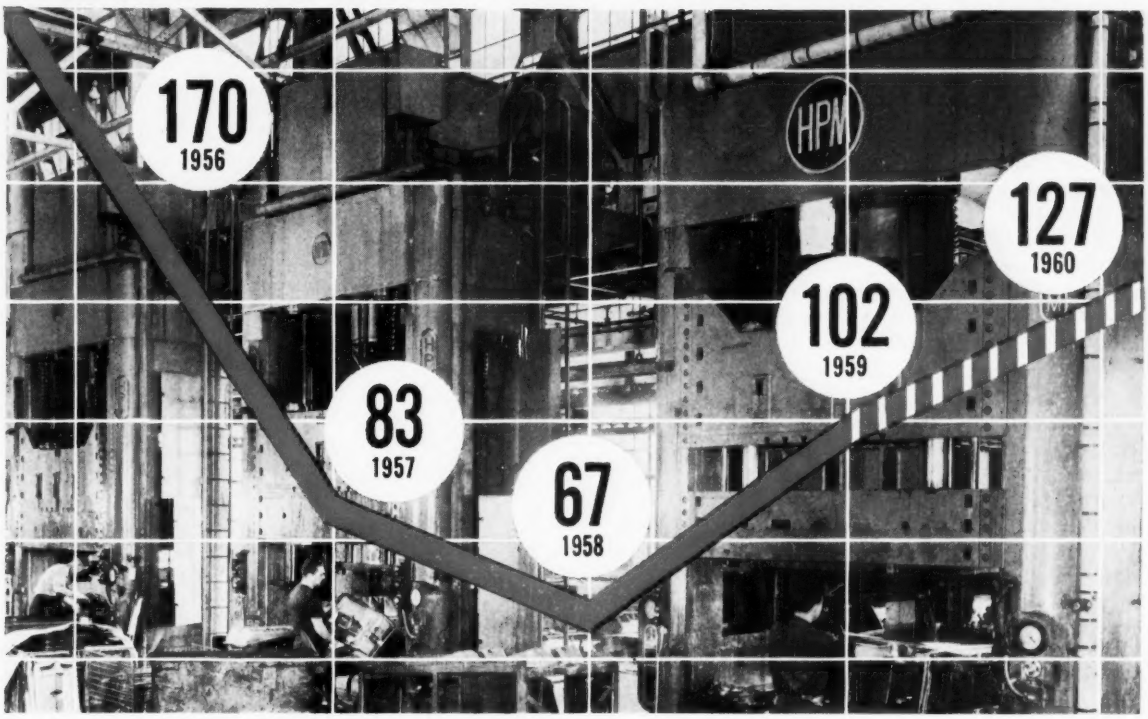
Lead-Zinc Action Coming

Look for the Senate to pass a resolution in August demanding reinvestigation of the lead and zinc import situation by the Tariff Commission. A Capitol Hill source close to the situation tells STEEL he expects no difficulty in passage by both houses of Congress.

This report comes on the heels of speculation that President Eisenhower is being urged to amend his proclamation regarding lead and zinc imports following last fall's Tariff Commission investigation. At that time, quotas were set on ores and concentrates, but not on mill products.

THE CAPITAL SPENDING **BOOM** BEGINS

Press Order Rate Heads Up



THE JAWS of a mighty press open and close so rapidly at Chevrolet's Brookpark plant in Cleveland that 250 transmission vanes can be formed per minute. Says G. R. Inglemann, Chevy's master mechanic:

This new Wean press replaced two other presses on this job to substantially lower our unit production costs.

Mr. Inglemann seems typical of capital equipment buyers today. He's slashing manufacturing costs by investing in new, more efficient equipment.

Thanks to such enlightened thinking (and the general uptrend in metalworking business), the average press manufacturer can look for 11 per cent more sales to metalworking in the coming six months than he had in 1959's first half. His second half, 1959, sales will probably be 35 to 40 per cent better than those of 1958's last half.

• **Two Surveys Prove It**—A new STEEL study of capital equipment spending plans (see STEEL, July 13, p. 56) discovers that metalworking companies will spend 11 per cent more for presses in 1959's second half than they did in the first six months.

A STEEL survey of 20 leading press manufacturers finds that the average maker looks for 11 per cent more sales in the second half than he had in the first. (Estimates range from "up 100 per cent" to "down 25 per cent.")

• **Here Are Buyers**—Selected companies representing nearly one-third of metalworking's total spending for capital equipment have told STEEL their confidential plans for capital equipment purchases.

The electrical machinery and equipment industry will be a top market for press manufacturers in the coming six months. It will spend 56 per cent more for presses in the second half than in the first, the STEEL survey indicates.

The auto industry will be like a little boy in a candy store with his grandpa when it steps up its press buying. It'll spend 40 per cent more in the second half than in the first. A big gain like that in a major press consuming industry is bound to bring joy to press salesmen. It signals the beginning of a significant sales uptrend.

Among other buying industries: Aircraft will boost spending 9 per cent; farm equipment, 4 per cent. The steel industry will spend 6 per cent less for presses in the second half than in the first.

Electronics and plastics manufacturers represent a growing market for the press industry, some producers report.

• **The Price They'll Pay** — More than half the press manufacturers

contacted by STEEL are still selling at their 1957 list prices. Only a handful boosted prices last year. But 1 in 4 makers raised prices this spring. The average increase: 7 per cent.

There's some doubt that the makers will be able to make the new prices stick. Sales volume hasn't risen enough to dull the competitive edge yet, believe some observers. One manufacturer reports he lowered his prices 10 per cent in January.

But as sales volume continues to climb, prices are bound to rise. Most producers have absorbed two wage increases and at least one steel price increase since they last revamped quotations. It means you can look for a wave of increases fairly soon.

• **Will Rise in '60**—The price hikes will probably come next year. Indications are that the boom in capital equipment spending will be underway by then. The average press producer looks for 25 per cent more sales next year than this year. That would bring the industry's dollar volume of orders back to double the 1958 figure—though still 25 per cent under 1956's high order rate.

A steel price increase could force press prices to rise immediately, some producers say. But others believe that rugged competition in the industry will hold quotations down for another six months or so.

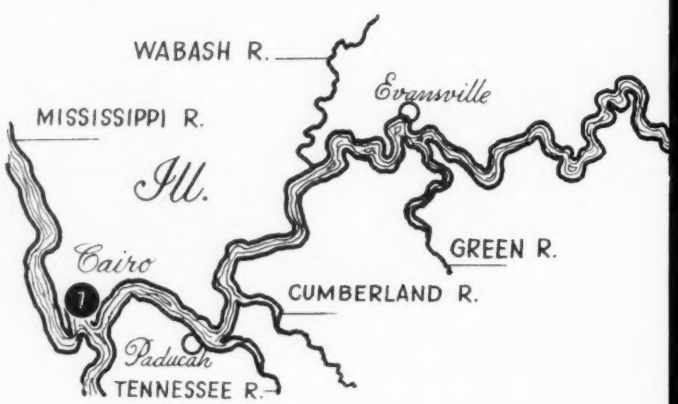
About 5 in 6 pressmakers have returned to 40-hour-per-week operations; 1 in 5 has added a second schift and 1 in 3 reports working overtime.

• **Stocks OK** — Deliveries should pose no great problem in the second half. About 1 in 3 press producers says an extended steel strike would cause shortages that would curtail production. Most could ride out a short walkout.

• **Wrapup** — Metalworking's rising profits, spiraling labor costs, and desire to lower unit production costs signal a good second half and a better 1960 for manufacturers of presses.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Ohio River Valley Bids to Be Another Ruhr

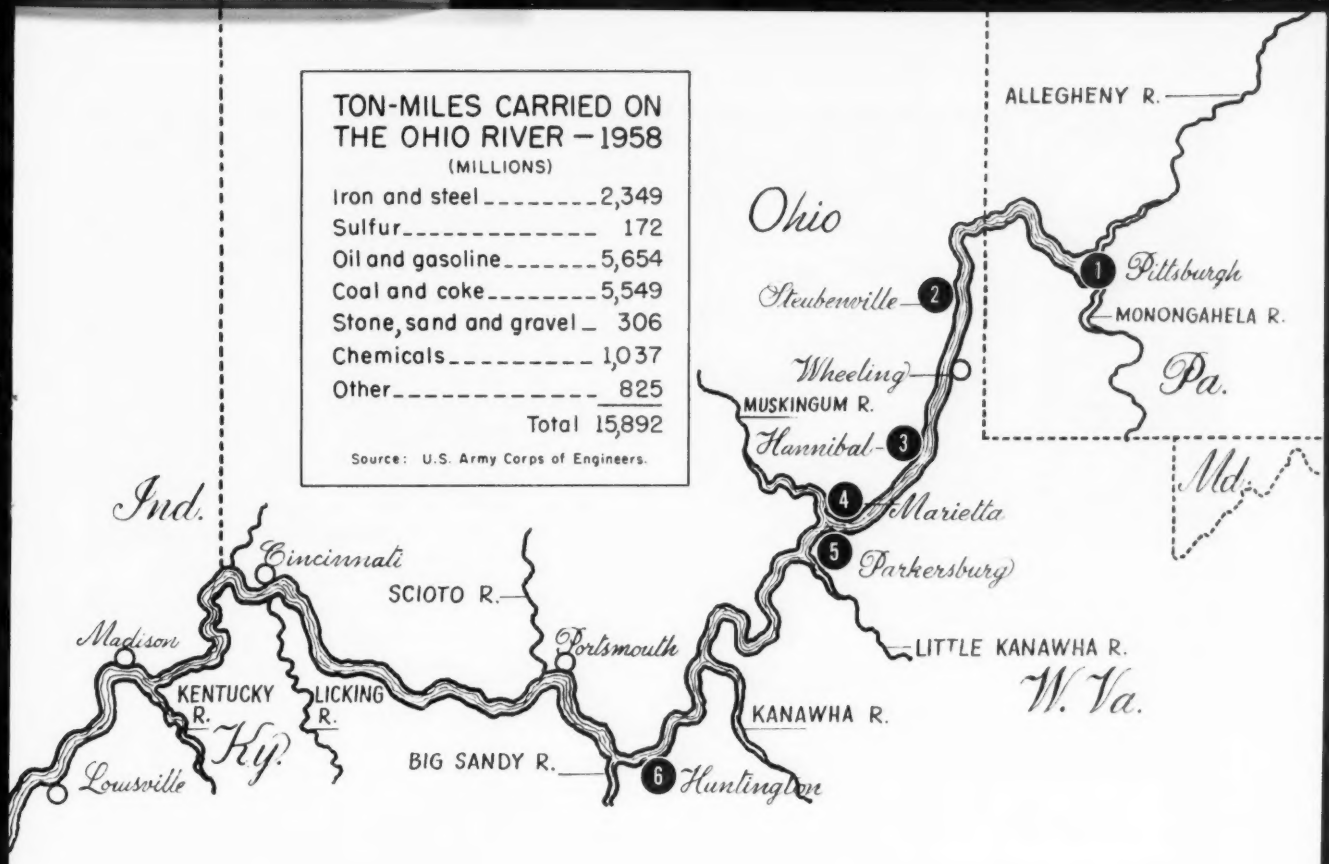


KEEP YOUR EYE on the Ohio Valley. If developers have their way it will become the heartland of America's industrial complex by 1975. Take this tour and see.

• **Booming** — From Pittsburgh's Golden Triangle, where the Allegheny and Monongahela merge (No. 1 on map), to Cairo, Ill. (No. 7 on map), 981 miles away, the mighty Ohio winds through some of the richest and fastest growing industrial developments of the century. Since 1950, industry has poured about $15 billion into the area. Reasons: Cheap and rapid transportation, convenient access to markets, abundance of economical power, and good labor supply.

• **End of an Era**—Riverboat travel has kept pace with the spiraling industrial growth. Today's pilots rely on radar and electronic depth sounding equipment rather than instinct and hand sounding gear. Barges pushed by modern diesel engines have replaced the old paddle wheelers. On the river (and the railroads and highways that parallel it) you'll see aluminum, titanium, zirconium, vanadium, machinery, fabricated metal parts, chemicals, glass products and textiles, plus the traditional iron, steel, coke, and coal.

• **Face Lifting**—In 1957, 81.5 million tons of cargo were moved 17 billion ton-miles over the Ohio. Tonnage dipped during the recession, but should hit an all-time high this year. To keep in step with the



anticipated upswing in river traffic, the U. S. Corps of Engineers is giving the system a multimillion-dollar face lifting. When completed, this modernization program will:

- Reduce lockages from 46 to 19.
- Eliminate double locking.
- Reduce transportation costs as much as 50 per cent.
- Bring Pittsburgh and Cairo within 20 miles of each other by rail or truck (from a mass transportation cost standpoint).

Area enthusiasts say that one riverboat can push barges carrying as much steel as 500 fully loaded freight cars. They point out that a growing volume of Ohio Valley traffic moves by water to destinations as far as New Orleans, Tampa, Fla., Houston, and Minneapolis. They talk about goods being freighted between the West Coast and Ohio Valley ports over an all-water route and about an Ohio River to Lake Erie Canal that would hook St. Lawrence Seaway shipping to the Ohio and its tributaries.

• **No Ruhr Yet**—The Ohio Valley has been called the American Ruhr. It's not that yet, but it may be in the next decade or two. Actually, the term has planners worried. They want a Ruhr—but one with parks, playgrounds, beaches, and strict water and air pollution curbs.

• **Wide Open Spaces**—Growth in the Valley hasn't been uniform. The bulk of development has been south of Huntington, W. Va. (No. 6 on map), down through Cincinnati and Louisville. Going north from Huntington, you find industrial development only in patches—such as Kaiser Aluminum & Chemical Corp.'s sprawling aluminum works at Ravenswood, W. Va. At the beginning of the Upper Valley, you come to Parkersburg, W. Va. (No. 5 on map), which grew from a sleepy river town of less than 30,000 in 1950 to a booming community of around 63,000 today—thanks to an influx of chemicals (Du Pont), metalworking (Carborundum), and glass (Libbey-Owens-Ford).

A few miles north of Parkersburg, at Marietta, Ohio (No. 4 on map), you'll find a Union Carbide Corp. facility, and across the river, at St. Marys, W. Va., American Cyanamid Co. has a plant. About the only new facility of any size that you'll pass in the next 50 miles is the Ormet Corp.-Olin Mathieson Chemical Corp., aluminum complex at Hannibal, Ohio (No. 3 on map). From Hannibal north to Steubenville, Ohio (No. 2 on map), industry consists primarily of basic steel and related works—mainly the complexes of Wheeling Steel and Weirton Steel.

• **Promoting**—The upper stretch of the Valley is getting a big push from its residents. The Upper Ohio Valley Development Council (a group of businessmen representing four Ohio counties, two West Virginia ones), in co-operation with other civic groups and companies, recently sponsored a two day, 131 mile, boat trip up the river from Marietta to East Liverpool, Ohio. Invited: Industrial executives, financial people, railroads, public utilities. Purpose: To show available river sites to interested companies, to bring representatives of these companies in contact with the bankers, merchants, transportation, and utility people they would deal with.

Congress Worries About Freight Car Shortage

PURCHASING agents and traffic managers who have struggled with periodical freight car shortages since the end of World War II have a friend in Kenneth Tuggle, chairman of the Interstate Commerce Commission. He is trying to persuade Congress to "alleviate" car shortages by allowing his agency: 1. To "encourage" the railroads to buy more cars. 2. To "promote expeditious movement and handling of freight cars" by stepping up demurrage charges to "insure prompt loading and unloading."

Mr. Tuggle told the House Transportation & Aeronautics Subcommittee that there are fewer freight cars owned by Class I roads today than there were ten years ago (1,776,684 on June 1, 1959, compared with 1,838,689 on Jan. 1, 1949). In effect, the ICC wants the right to add special charges to the per diem of $2.75 per car when there is a shortage. The charge would be made against "deficient carriers" (railroads which don't own enough cars to handle their traffic and prefer to rent them). The charge would presumably be high enough to make renting cars less profitable than owning them. As an alternative solution, the agency is willing to have Congress grant it the right to set per diem charges high enough to serve "as an incentive for construction and maintenance of an adequate supply" of cars.

But Will It Ever Act?

Congress has toyed with the car shortage before, but this time some of the legislators appear determined to act at last. Involved is a basic disagreement between the two types of carriers—originating and terminating. Terminal roads serve the metropolitan centers and coastal areas. Originating roads come out of the less populated regions of the country. Terminal roads need to own far fewer cars than originating carriers because they take over the cars of the originating roads as they enter the heavily populated areas. So terminal roads favor renting, rather than owning.

The politics are obvious and tend to favor the terminal roads because of the population-determined makeup of the House of Representatives. That is precisely why the ICC has never been able to hold the power to set per diem rates as high as the originating roads would like them.

The terminal roads charge "price fixing." In the middle is the Association of American Railroads which, as a trade group, recognizes its duty to maintain efficient transportation. But it is forced to adopt a "wait and see" attitude toward the ICC's proposals. It told Congress: The roads can work out the problem for themselves through a recently appointed "study group." Some legislators think the roads have had long enough to work out a solution. Seeing none, they are ready to act. Question: How many congressmen can go along with the ICC's desires. Answer: Not enough to bring about an equitable solution, unless they receive some wholehearted support from their constituents.

Modern Army Mired in Mud?

Sen. Stuart Symington (D., Mo.) led an attack last week to increase the Army's modernization funds by more than $200 million, but lost in the Senate on a 48 to 43 vote. Congress has increased the funds for mobile equipment to be used in limited awards, but Senator Symington claims the Army will lose about $250 million in carryover funds this fiscal year. The close vote indicates growing support for the Army's case. Gen. Maxwell Taylor reportedly quit as Army chief of staff because the Pentagon hierarchy wouldn't listen to his limited war arguments. His resignation has shocked some legislators. At one time he asked Congress for $15 billion in new weapons. The Senate fight found 40 Democrats and three Republicans supporting Senator Symington's position.

The Navy fared a little better in the annual brawl for defense funds: Congress O.K.'d almost $400 million for a second nuclear aircraft carrier.

Small Business Opportunity

If you are a small firm interested in research and development, you have until Aug. 1 to send your name to the Small Business Administration for listing in a directory for government purchasing offices and prime defense contractors. If interested, ask the local SBA office for Form 449.

Need a Business Plane?

Surplus C-46 aircraft (110 at $50,000 to $60,000 each) will go on sale within 60 days, says the General Services Administration. The C-46 is a twin engine transport of World War II vintage. A 25 per cent down payment and three years to pay are Uncle Sam's terms. Interest on the unpaid balance will be 5 per cent. Contact National Bidders Control Center, Kelly Air Force Base, San Antonio, Tex.

New "washing machine" makes CLEAN stainless steel

More often than not, titanium-bearing stainless can hike your fabrication costs . . . due to subsurface stringers or banding that cause excessive scrapping of parts. At Eastern, however, these harmful inclusions come out in the "wash."

Eastern's exclusive slag wash melting process produces the *cleanest* titanium-bearing stainless you can buy . . . exceptionally free from non-metallic contaminants . . . and at *no extra cost.* Eastern's new high-capacity slag furnace will meet industry's growing demand for such titanium-bearing steels as 321SW, 19-9DL, A-286, 19-9DX. Which do *you* need—and how fast?

EASTERN STAINLESS STEEL

Baltimore 3, Maryland, U. S. A.

Reducing Billets to Wire Rods in Continental's Continuous Rod Mill. From an original scratchboard drawing by James R. Neebe.

"Speedway" for Hot Rods

From billets to rods—three strands at a time travel through Continental's modern new Continuous Rod Mill. In the complete rolling process a 2½" round cornered square billet 30 feet long may be reduced to a .218 inch diameter round wire rod approximately 4,700 feet long. The glowing strands can be seen as they progress through 22 roll stands. At the final pass the rod is moving at a speed of about 5,000 feet per minute.

It's all a part of the important job of making wire for home, farm and industry . . . wire for more than a thousand applications. For from the shoes on your feet to the mechanical pencil in your pocket, from coat hangers to automobile control rods, wire plays an important part of our daily life.

Here at Continental's Rod Mill, steel rods are produced around the clock and sent to the wire mill for drawing, processing, and finishing into wire in a wide range of sizes and finishes. All Continental Wire is made from basic open hearth steel, in practically any size, temper, and analysis in low and medium low carbon steels. It will pay you to learn the whole story of Continental Wire—and how it can speed production and cut costs for you. Write for our new Manufacturers' Wire Manual today.

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PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, Kokote, Brytite, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Concrete Reinforcing Fabric, Continental Chain Link Fence and other products.

GM's Argonaut Realty Div. Presents the Case

To Build ? or Remodel

Production and Operation

Can design plant and equipment from ground up for greatest efficiency and future expansion. Useful when starting new products or programs.

Location can be picked for ease of transporting materials and finished goods. Can locate in advantageous labor areas.

Preventive maintenance may be governed by statistical control to cut costs.

Land and buildings may be sold to real estate interests on a lease back deal to free capital for other uses.

Lower initial capital investment; possibly quicker profits. Takes less time than building.

Production facilities and equipment may be adequate with relatively few changes.

It's often possible to use labor force already in the plant. Be sure they have or can acquire the skills you'll need for your job.

Secrecy can be maintained better if you're developing a new competitive product or are engaged in defensework.

Construction

New plants can be built in such a way they can be easily expanded if necessary. Utilities can be centrally located on property to leave room for expansion. You'll be sure of getting all the power and other utilities you'll need.

Architecture is modern and incorporates latest in fire protection, maintenance, and parking facilities.

You can lay out a complete development plan for the whole area. It can be developed as your needs increase.

Existing plants may have been used for similar production. They'll require few changes.

Alterations often can be carried on after production has been started.

Plant and area may already have been laid out for further expansion. You'll save time by being able to use existing plans.

Real Estate

Can pick best geographical site from standpoint of market area, land costs, utilities, highways, and taxes.

May be able to get special considerations on taxes and zoning. Be sure groups or persons making such commitments can and will carry them out.

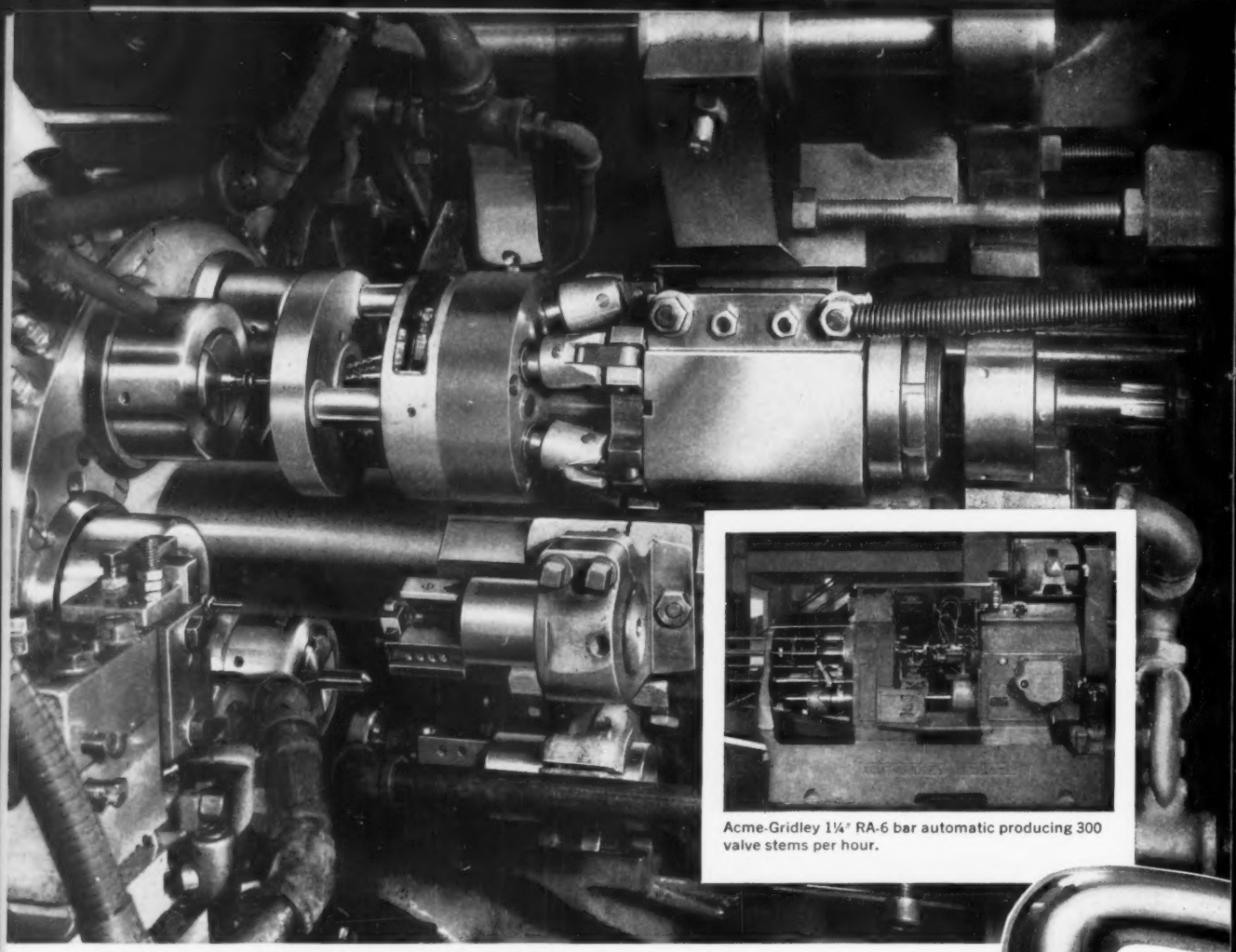
Can pick area with eye to good community and public relations as well as advertising value of the plant itself.

Usually can get quick possession if there are no delays due to title searches, litigations, or zoning changes.

If you're buying to remodel, you'll often inherit favorable community relations developed by the previous owner.

Buying and remodeling may insure that taxes and special assessments won't increase after you move in.

Regardless of what you decide, remember that it's the return on investment that counts. Develop a checklist based on these recommendations. Each listed advantage has a corollary disadvantage. Appoint a group or committee to make the survey. Make sure all members of your management team understand the reasons for the final decision. Don't be afraid to plan big. You're apt to need more space before you know it.



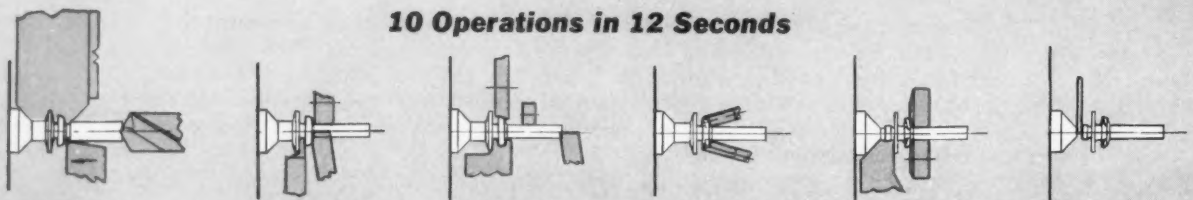
Special Namco-designed multiple end milling attachment in the 3rd position.

Acme-Gridley 1¼" RA-6 bar automatic producing 300 valve stems per hour.

When Tolerances and Finish
Looked Economically Impossible

AMERICAN-STANDARD TURNS TO ACME-GRIDLEY...

10 Operations in 12 Seconds



6th position
Rough form rear
—rough turn stem
—spot drill

1st position
Finish turn stem
face large diameter

2nd position
Shave—face and
chamfer stem end

3rd position
Stop spindle—
mill six slots

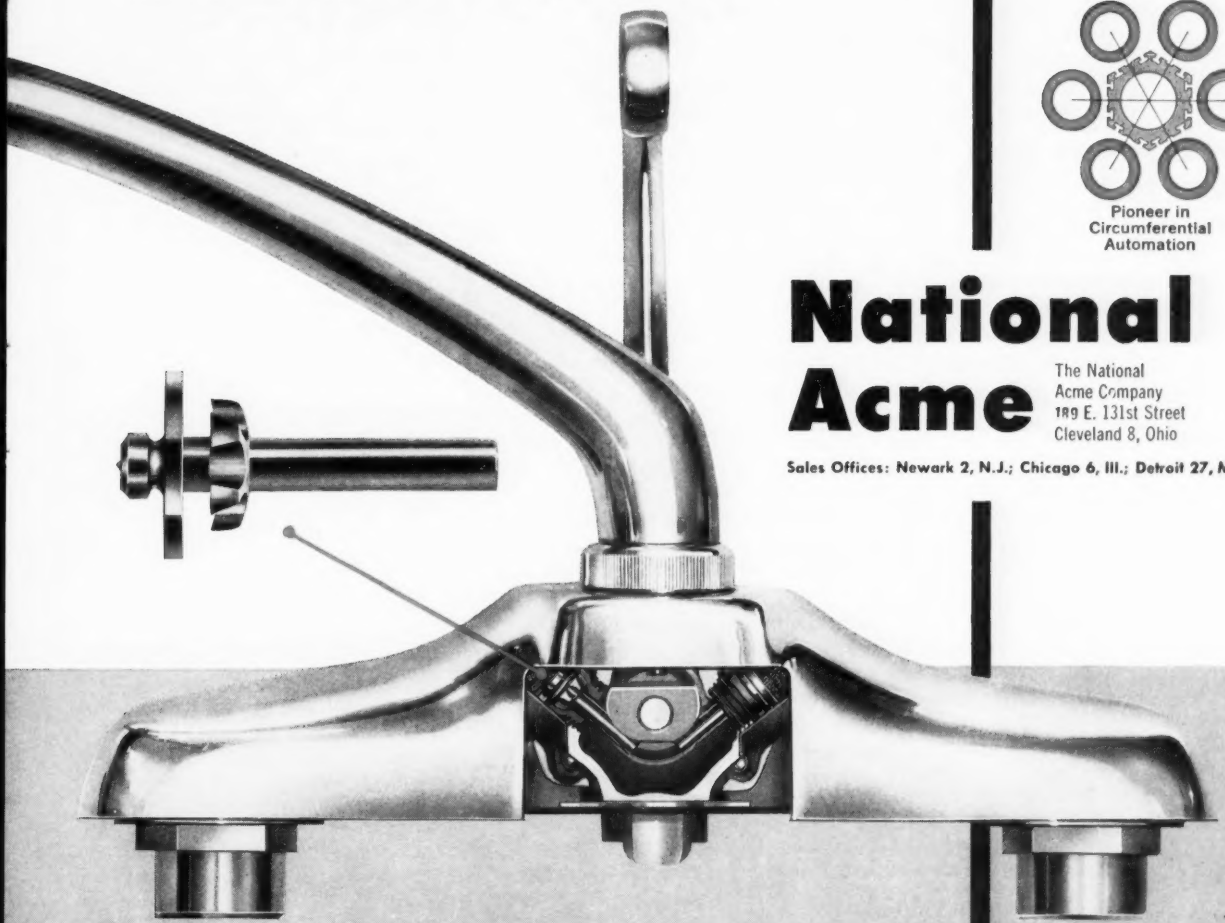
4th position
Start spindle—
burnish stem—
form back end

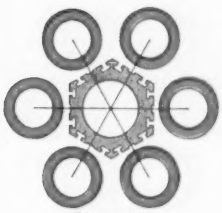
5th position
Cutoff

COMPLETED IN A SINGLE SETUP . . . this hyseal valve stem is a vital component in American-Standard's single-lever mixing faucet. Production by other processes would have meant a two-piece assembly. It would have been economically impossible to meet the high standard of quality and exacting tolerances maintained on this company's products.

Ten operations, including multiple end milling of six half-holes on a 15° angle, were performed on this 303 stainless steel piece in 12 seconds. Rigid specifications required a 20 microinch finish and limits of .002 t.i.r. between seating surface and end of valve stem.

Advanced spindle stopping design and the inherently accurate indexing of Acme-Gridleys, assure proper alignment of the work with the standard and special tool attachments. This, together with wide open tooling zones and independently operated tool slides, helps assure the solution of "impossible" jobs at National Acme. Write or ask one of our representatives for the complete story on the industry's most modern approach to your cost reduction problems.





Pioneer in Circumferential Automation

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QUEST FOR JOB SECURITY

Supplemental Unemployment Benefits

What Labor, Management Want

BOTH management and labor view SUB (Supplemental Unemployment Benefits) as an interim measure in the quest for job security. Both have different goals in mind.

Labor thinks of it as a step toward the guaranteed annual wage.

Management hopes to use it as a device, like the pension, to gain something of a guarantee of employee loyalty to the company.

• Labor and management also tend to differ in basic approach.

Labor favors the general fund or group approach to SUB. Only the people who get laid off benefit.

Management favors the vested fund or individual approach. In effect, each employee builds up a personal fund which he can tap in a number of contingencies, including layoffs and retirement.

• Few big changes are expected in the immediate future.

Of course, labor wants larger payments for longer periods, but it's unlikely that such demands will be pushed until state unemployment payments are increased.

Labor's most immediate want: Changes in credit accumulation so lower seniority workers can collect maximum payments sooner.

Variations of vested programs (like the glass industry's) are expected to become more popular with management than general fund plans (like the auto industry's). The trend will probably be especially pronounced among small companies.

Example of vested plan: General Motors Corp. offered rubberworkers at its Inland Mfg. Div., Dayton, Ohio, a choice between SUB and a vested income security plan. Employees chose the vested approach. They can draw funds from their accounts when they're laid off, quit, or retire.

Detroit's Tool & Die Association has a supplemental pension program for small firms. Contributions are 5 cents an hour. Payments of $90 times years of seniority are made upon retirement, unemployment, quitting, or death. Since it's considered a pension plan, it avoids many of the income tax restrictions placed on other vested accounts.

• Look for a severance pay provision to be tacked onto many SUB plans.

City Auto Stamping Co., Toledo, Ohio, started it two years ago. Ford added such a clause last year. Workers

IN AUTOS

(Covers 700,000 Workers)

FINANCING

Company pays 5 cents per man per hour into a single fund. Maximum funding is generally figured on the basis of $400 per employee. Adjustments are made annually on the basis of average benefits paid in previous 12 months.

ELIGIBILITY

Minimum of one year seniority and ½ credit unit are required. Employee must be registered with state unemployment office and must meet all eligibility requirements for state aid.

Grounds for disqualification: If layoff was employee's fault due to strike or picketing at company plant or involving company employees. Payments also aren't made if layoff was caused by war, sabotage, or acts of God.

PAYMENTS

Credit units, earned at rate of ½ unit per week of work, are canceled for benefits on basis of seniority and fund position. Up to 39 benefits may be accrued. Payments make up the difference between state unemployment compensation and 65 per cent of net, straight time, takehome pay. Maximum payment is $30. Maximum length of benefits is 39 weeks.

Credit units are forfeited if seniority is broken, or if application claims are misrepresented. If layoff extends for more than a year, benefits may be claimed as severance pay in most companies.

ADMINISTRATION

Appeals go to local committee then to administrative board for final decision. Administrative costs are paid from funds. Company is reimbursed annually on basis of certified cost statement. Trustees deduct any required taxes.

• This is the second in a series of three articles on job security. The first ran July 13 and the third will appear July 27. An extra copy of any or all in the series is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

IN GLASS
(Covers 30,000 Workers)

FINANCING

The security benefit plan (SBP) is a vested program. The company contributes 10 cents per man per hour into separate trust accounts for each employee. Maximum is $600. Additional funds go into employees' supplemental vacation fund.

ELIGIBILITY

Required minimum of one year seniority. Employee must be laid off for one full pay period or be absent at least two consecutive full pay periods due to sickness or injury (payment is retroactive). Employee may be disqualified if layoff was disciplinary or caused by a strike in the bargaining unit.

PAYMENTS

Employee can withdraw money from his account when he's sick, laid off, or fired. No payments can be made when worker is on strike. Maximum weekly withdrawal is $30 or 10 per cent of balance in account until fund is exhausted. Minimum is $15. Lump sum payments are made if he quits or is fired. If he dies, heirs get lump sum payment.

ADMINISTRATION

Costs are paid by the company. Funds are subject to withholding tax. Appeals are determined by a union officer and company representative. Internal Revenue Service must rule contributions are deductible, and Labor Department must rule they're not part of regular employee pay rate. (This applies to all plans.)

IN RUBBER
(Covers 125,000 Workers)

FINANCING

The company contributes 3 cents per man per hour. Maximum funding is based on an amount equal to $185 per each covered employee. Adjustment of maximum fund positions is not provided for.

ELIGIBILITY

Minimum of one year seniority and ½ credit unit are required. Employee must meet state unemployment compensation requirements, must have had one layoff week in the calendar year, and cannot have refused work under bargaining agreement. He must report to the plant weekly and is not eligible for disability benefits or for other unemployment benefits from his company or any other employer with which he has greater seniority (moonlighters try to collect twice). Disqualifications are similar to those of auto plan.

PAYMENTS

Credit units are exchanged for benefits on basis of seniority and fund position. Units are earned at rate of ½ per 18 or 20 hour week, depending on type of bargaining unit. Payments make up the difference between state unemployment compensation, plus any other compensation, and 65 per cent of net takehome pay. Maximum payment is $25. Additional payments are made for dependents.

Credit units are forfeited permanently for seniority termination, for 24 months of continuous layoff, or for misrepresentation of facts.

ADMINISTRATION

Administrative costs are paid from fund. Trustee deducts required taxes. Appeal program is same as in auto plans.

IN STEEL
(Covers 750,000 Workers)

FINANCING

Company contributes 3 cents per man per hour, and another 2 cents is held in reserve if original funds are insufficient. Maximum funding originated on basis of 10.5 cents times total hours worked by covered employees in first 12 of last 14 months preceding month for which maximum financing is being figured. Readjustments are made on the basis of average payments covering same period.

ELIGIBILITY

Minimum of two years' seniority and one credit unit. Employee must meet state unemployment compensation requirements and receive a state benefit without company protest, report weekly at reasonable times and locations, and must not be on vacation layoff with pay.

Employees do not get payments if layoff is disciplinary, results from USW strike or work impairing activities anywhere, or if caused by war, government regulations, sabotage, or an act of God.

PAYMENTS

Credit units, earned at rate of 1/10 unit for each 8 hours worked, are exchanged for benefits on basis of continuous seniority and fund position. Maximum accumulation in any 12 months is 26 units. Total accumulation is 52. Units are also earned for certain union business and for compensated disability time lost.

Payments make up difference between unemployment compensation and 65 per cent of net takehome pay. Maximum is $25, plus $2 each for not more than four dependents. Maximum rises to $47.50 after state payments are exhausted.

Credit units are forfeited following a break in continuous service. Company determines how many units will be canceled if forms are falsified or information withheld.

ADMINISTRATION

Company and union representatives attempt to settle differences. A mutually selected umpire has final decision. Administrative costs are paid by the company. Taxes are deducted from benefit payments.

*All plans adapted from information in *Labor Trends*.

who have been laid off for a year can collect separation pay from SUB funds. "We used this when we had to close down our Memphis, Tenn., plant, and it worked well," declares Malcolm Denise, Ford Motor Co.'s general industrial relations manager.

• A look back: SUB has worked out better than many people expected it would.

Some feared it would cost too much to administer. A Big Three auto firm says its 1958 administrative expenses came to $580,000, or 67 cents per claim. A shop employing 350 puts its per claim cost at $1.10. Those are probably the extremes.

An earlier fear that SUB would make workers seek layoffs has proved groundless. In fact, an unexpected benefit has popped up in this area: Firms are gaining cost savings and reducing SUB payments because they are paying closer attention to work scheduling so they won't be forced to lay off men unnecessarily.

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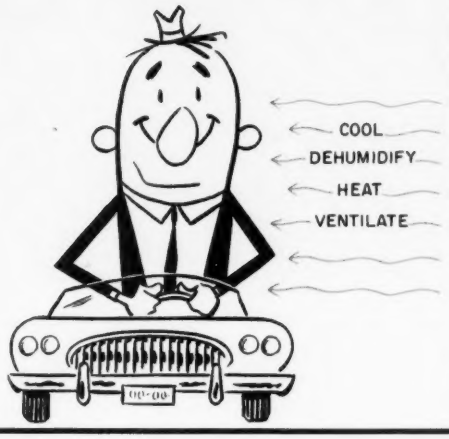
Sales Up in Auto Air Conditioning



Installations Keep Climbing

(Per cent of model year output)

	1959*	1958	1957
General Motors	7.8	6.1	5.0
Ford Motor	4.7	2.5	1.8
Chrysler	5.1	3.8	3.6
American	4.7	4.8	6.4
Studebaker	0.5	0.4	0.4

*Estimated.

Source: *Ward's Automotive Reports.*
Does not include independent sales.

CAR COOLER SALES are getting hot. They're expected to reach 620,000 units this year. Automakers will sell 340,000 as factory installations. A dozen independent manufacturers will market the rest. The goal is the same as that projected for 1958, but the recession kicked sales down to 360,000 units—a 14 per cent drop from 1957's.

More than 50 per cent of the air conditioners still are used in southwestern states. (Texas car owners buy half of those.)

Ward's Automotive Reports says each of the top luxury car lines installs coolers on 4 out of 10 units. Some 30 per cent of the factory installed jobs go on Fords, Chevrolets, Plymouths, Ramblers, and Larks, indicating growing acceptance among buyers of lower priced cars. Chrysler's Dodge Div. claims cooler sales are 50 per cent ahead of those in 1958—up to almost 3000 units or 4.6 per cent of first half production.

• **Cooled Off** — Although 90 per cent of the country's theaters, 94 per cent of its restaurants, and 35 per cent of its hotelrooms are air conditioned, coolers are installed on less than 6 per cent of all the cars on U. S. highways. Price and size still are the major deterrents, say industry sources.

Nonetheless, volume has increased enough and auto company engineers have made enough improvements to lower average factory prices more than $150. (Typical 1954 units cost $590; they're now $430.) Independent "hang on" jobs still run between $275 and $350. Ford Motor Co. estimates you'll only lose about $75 on the initial cost of a cooler if you trade in your car after three years. That $25 a year is a cool price for comfort if you drive more than 10,000 miles annually.

Sam Lee, president, Lee Fleet Management Inc., Cleveland, indicates Ford's figures don't apply to fleet owners. He says maintenance costs on coolers average about $8.50 a year. The unit adds only $75 or $100 to the trade-in value; less if it's not a factory installed job. Most firms figure a salesman can pay for his own conditioner if he wants one, adds Mr. Lee.

• **Cubes Change**—Among air conditioner improvements are smaller packages offered by independents. Most of these fit between the transmission hump and the dash so they have to be pretty flat. Novi Equipment Co., Novi, Mich., has one of the smallest packages. It's 4½ in. high.

Rear trunk coolers have just about died out because they take up space needed for luggage and make for too much piping between evaporator, condenser, and compressor. Heater-cooler combinations are becoming more popular as factory installed options. They cost about $100 more than the conditioner alone.

• **Chilly Frills** — Keeping up with changes in auto styling seems to be the biggest gripe of air conditioning engineers. About the time they manage to boost a cooler's efficiency without adding to its cost, car designs change and the industry starts calling for more coolability. Increased glass area in cars means more heat collects inside. Higher compression engines, snuggled up against evaporator units in overcrowded engine compartments rob coolers of output.

Engineers figure heat losses total 14,000 Btu an hour or 1.22 tons of cooler output. Result: Most coolers have been boosted from 1½ to 2 ton capacity. That calls for a

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bigger package. And it now looks like 2½ tons may be needed.

• **Frosty Costs**—For ideal efficiency, coolers should be coupled with larger engines because they use between 4 and 7 hp while operating. Since the compressors have to run under widely varying loads coolers may have to lower temperature from 125 to 72° F in 5 minutes), heavy duty batteries and generators also should be used. Air conditioning tends to promote vapor lock. Few drivers want to fiddle around with special high volatility fuels for air conditioned cars, but they will settle for four barrel carburetors which offer some help.

Obviously, ideal efficiency can't be obtained unless cars are designed specifically for air conditioning (most unlikely), or unless costs are increased to include all these changes when a system is installed. Neither is apt to happen, so engineers continue to compromise size and efficiency against cost. That's one of the reasons why factory installed units, designed for specific cars, are more efficient.

• **Cool Future**—The industry continues to strive for a low cost, portable, plug-in unit that will fit under the seat or dash and can be switched to a new car when the old one is traded. Some of the "hang ons" come close, but independent companies find it tough to develop the volume that will let them cut production costs.

It looks like a low cost cooler is still some years away. Meanwhile, factory built jobs seem to be winning a larger share of cooler sales, particularly in states where heaters are used too. As volume increases, production costs will drop. M. R. Morrow, Humble Oil & Refining Co.'s research and development expert, estimates 1.4 million car coolers will be sold next year. That seems high, but it's quite likely that 1960 will see 900,000 buyers who can roll up their windows and smirk when the thermometer hits 90° F.

THIS SPEED CONTROL UNIT can be installed by do-it-yourself fans in less than an hour, claims Glide Control Corp., Inglewood, Calif. The electronic-mechanical device sells for $30 through distributors. It's attached to the carburetor and controls speed through fuel flow. To cut in the unit, the driver accelerates to desired speed; then touches the floor control switch. The device is cut out by pressing the switch again or by touching the brake pedal

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	558,026	337,446
6 Mo. Totals	3,283,934	2,242,348
July		321,017
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
June 13	127,029	78,163
June 20	129,270	84,396
June 27	127,217	92,277
July 4	108,397	35,273
July 11	125,996†	73,062
July 18	126,000*	85,533

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Auto Safety Specs Urged

Uncle Sam is harrying Detroit again. The House Subcommittee on Health and Safety, headed by Rep. Kenneth A. Roberts (D., Ala.), would like to have the federal government set specifications on automotive safety devices.

Such a measure seems doomed from the start. The Automobile Manufacturers Association told Congressman Roberts it feels that, if design details become mandatory, further development will be restricted and engineers will wind up designing to inflexible and sometimes outdated codes instead of solving basic problems.

What Uncle Sam should do is to turn its efforts to more research on highway design, traffic engineering, and "the human aspects of motor vehicle operation," thinks the AMA. Problems of safer car design should be left to industry engineers since they are specialists. To justify its position, the AMA cites industry progress in driver vision, signal devices, safer passenger packaging, control mechanisms, more responsive performance, and mechanical reliability.

Congressman Roberts and the AMA agree on one thing—the government's passenger cars should be equipped with many of these safety devices to set an example for other drivers. Mr. Roberts apparently feels it's smart to board up his own windows before casting more stones.

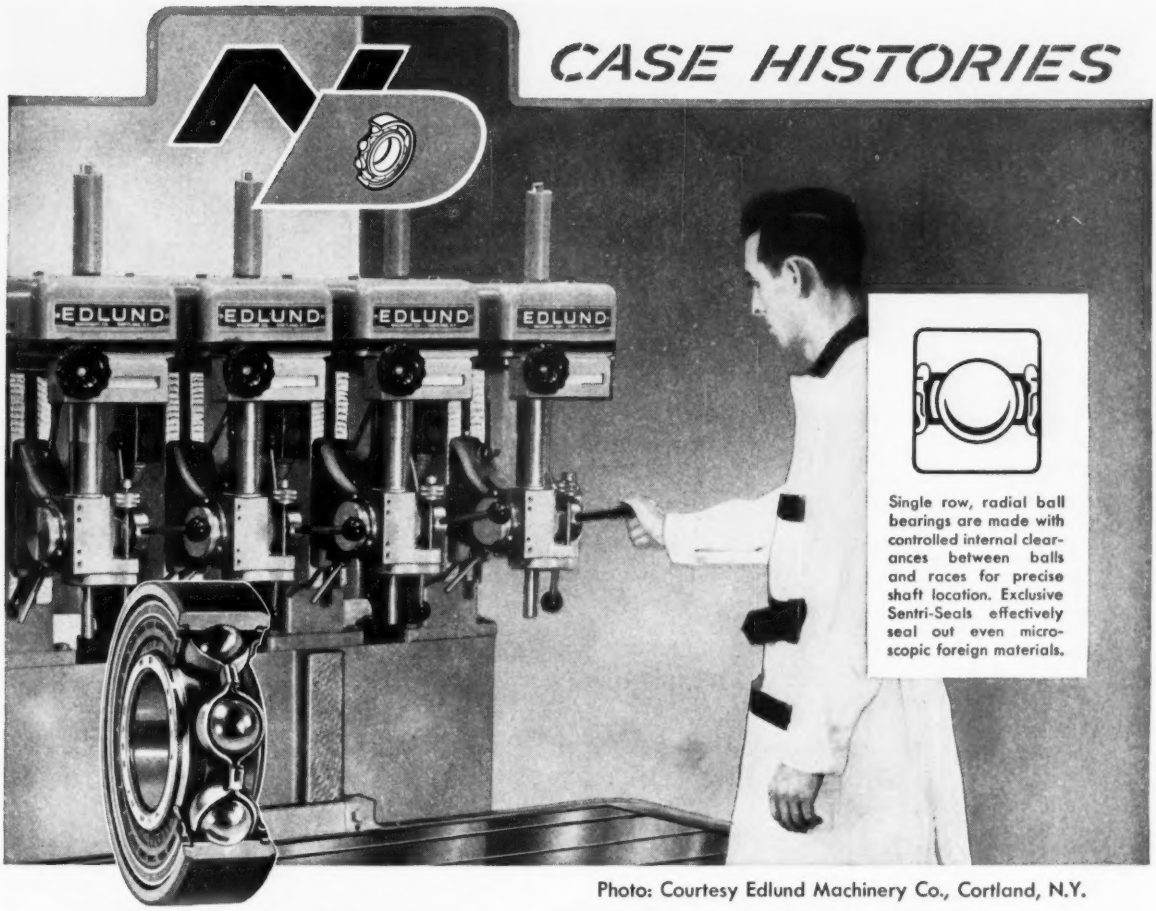
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Photo: Courtesy Edlund Machinery Co., Cortland, N.Y.

Ball Bearing Design Adds Efficiency... Cuts Relube Maintenance In Drilling Machine

CUSTOMER PROBLEM:

Tool manufacturer requires minimum maintenance ball bearing design for new high-speed multiple drilling machine.

SOLUTION:

N/D Sales Engineer, cooperating with company engineers, recommended New Departure ball bearings with exclusive Sentri-Seals in place of conventional open bearings. These ball bearings, sealed and lubricated for life, virtually eliminated bearing relubrication maintenance. In addition, these sealed bearings accounted for a savings in parts and assembly time by eliminating costly lubrication plumbing and fittings. What's more, the application has proved so successful, the customer has had other types of drilling machines redesigned to use New Departures.

If you're working on new machine designs, why not call on New Departure? There's probably an N/D *production* ball bearing that will help you, and, at a lower cost! For more information write Department T-7.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

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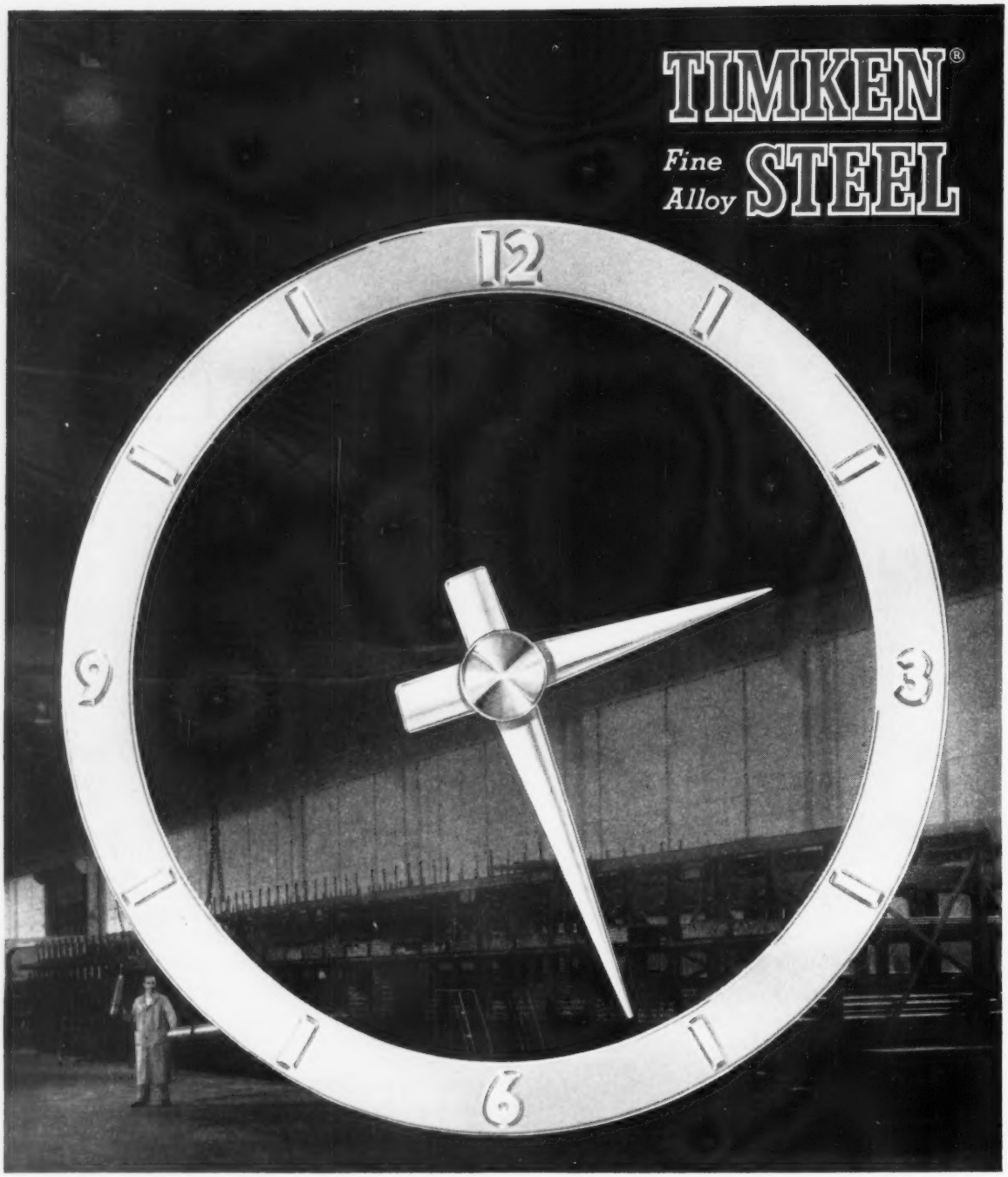

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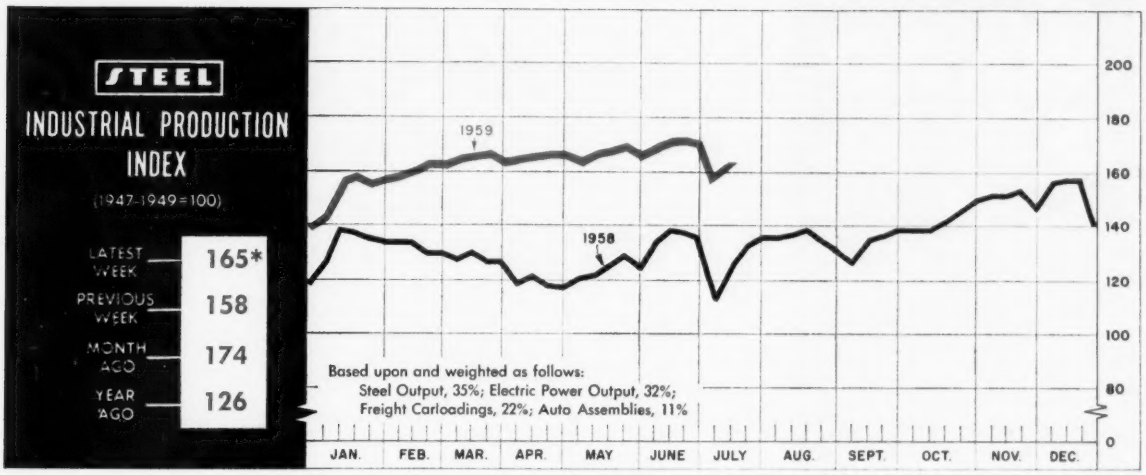

*Week ended July 11.

Uptrend Steeper than Most Believe

STATISTICS don't show it yet, but this has been a steeper business uptrend than most people realize. Businessmen—top level officials in all types of metalworking companies—tell this to STEEL.

Even makers of machine tools, the last major industry to swing into the main current of the recovery, tell us that backlogs are climbing and work forces are increasing.

• **Too Conservative** — Everybody knew months ago that things were going to get better—maybe even come up to previous levels in a few lines. But it was a rarity last January to find anybody who would talk about boom in 1959. Yet boom it is. The statistics are slow to show this because they lag by two weeks or so to three months. But the men who run metalworking know it. Within the last couple of weeks, STEEL's editors have sounded them out in formal surveys and informal conferences. Here's what they tell us:

Many have record backlogs.

Some have skilled labor shortages or expect them soon.

Last year's "excess capacity" has all but vanished.

Inquiries have never been higher, with greater conversions to sales.

A few are in the "early stages" of planning for a new round of expansion.

• **Latecomers** — The glow is especially evident in the capital goods field. Some who have been on rock bottom for months suddenly find themselves zooming. They find themselves stuck with underpriced backlogs—stuff that was taken just a few months ago when bids were pared drastically just to get enough business to keep the shop going.

They say that STEEL's survey of capital spending (see July 13, pp. 56-59) showing an anticipated 35 per cent increase for the second half over the first is right down the line.

• **Not Just Wishing**—The statis-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	849[1]	2,252	1,481
Electric Power Distributed (million kw-hr)	13,700[1]	13,200	11,851
Bituminous Coal Output (1,000 tons)	1,690[1]	8,585	1,331
Crude Oil Production (daily avg—1,000 bbl)	6,900[1]	6,914	6,439
Construction Volume (*ENR*—millions)	$578.4	$474.1	$559.0
Auto, Truck Output, U. S., Canada (*Ward's*)	161,331[1]	139,829	96,855
TRADE			
Freight Carloadings (1,000 Cars)	610[1]	573	491
Business Failures (Dun & Bradstreet)	244	256	292
Currency in Circulation (millions)[3]	$32,112	$31,858	$31,384
Dept. Store Sales (changes from year ago)[3]	+7%	+7%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,794	$26,018	$18,815
Federal Gross Debt (billions)	$284.5	$284.4	$276.0
Bond Volume, NYSE (millions)	$29.1	$23.4	$23.8
Stocks Sales, NYSE (thousands of shares)	18,720	12,957	12,510
Loans and Investments (billions)[4]	$94.7	$94.5	$95.3
U. S. Govt. Obligations Held (billions)[4]	$27.3	$27.5	$32.6
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	221.3	221.4	195.9
All Commodities[7]	119.2	119.3	119.3
Commodities Other than Farm & Foods[7]	127.9	127.9	125.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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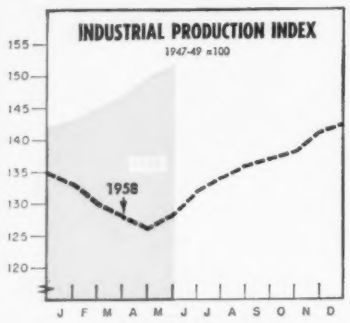
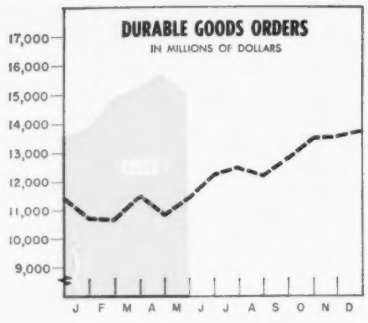
THE BUSINESS TREND





(Seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1959	1958	1959	1958	1959	1958
Jan.	143	133	125	100	166	159
Feb.	145	130	138	95	168	153
Mar.	147	128	146	91	170	150
Apr.	150	126	149	86	173	146
May	152*	128	153*	91	178*	148
June	...	132	...	103	...	151
July	...	134	...	102	...	154
Aug.	...	136	...	109	...	156
Sept.	...	137	...	113	...	155
Oct.	...	138	...	123	...	155
Nov.	...	141	...	123	...	163
Dec.	...	142	...	123	...	165
Avg	...	134	...	105	...	155

Federal Reserve Board. *Preliminary.
Charts copyright, 1959, STEEL.

	New Orders*		Sales*	
	1959	1958	1959	1958
Jan.	13.900	10.704	13.541	12,646
Feb.	14.918	10.688	13,870	12.038
Mar.	15.308	11.488	14,370	11,670
Apr.	15,800†	10.833	15,200†	11,532
May	15,100†	11,428	15,400†	11,643
June	.....	12.245	.....	12,086
July	.....	12.512	.....	12 256
Aug.	.....	12,177	.....	12,385
Sept.	.....	12.859	.....	12,723
Oct.	.....	13.530	.....	12.943
Nov.	.....	13.574	.....	13,295
Dec.	.....	13,673	.....	13,613

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.

tics and estimates which are available right now show that these men aren't engaging in wishful thinking. In the second quarter, gross national product reached a record of about $475 billion—maybe a bit more. One poll of the "experts" indicated at the turn of the year that the average annual rate for 1959 would reach $460 billion. It'll come close to $500 billion by yearend, about three to six months ahead of the original estimates.

Industrial production is just as impressive. One opinion survey late in 1958 predicted the Federal Reserve Board's industrial production index would hit 147 (1947-49 =100) by next December. In May, it was 152 (see graph above), and likely climbed a point in June.

Construction was supposed to set a record this year about 3 or 4 per cent above the 1958 level. W. R. Wilkenson, vice president of Johns-Manville Corp., declares it will be closer to 14 per cent. Building will come to $56 billion, and modernization and maintenance will add another $22 billion, making a grand total of $78 billion.

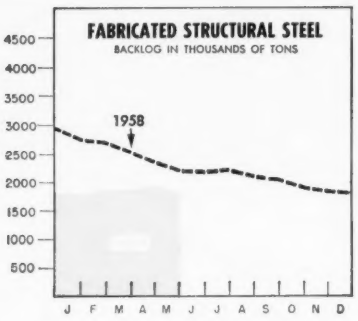
Auto production has made the yearend optimists seem like pessimists in retrospect. They had forecast 5 million to 5.5 million cars would be produced this year. But sales boomed 35 per cent ahead of the 1958 pace in the first half, and now even a 6 million unit guess is considered only minimum.

Finally, there's steel production, estimated early in 1959 at 112 million tons for the year. But with a record first half leading the way, 116 million tons looks more like it, unless there is a long steel strike.

Production Index Dips

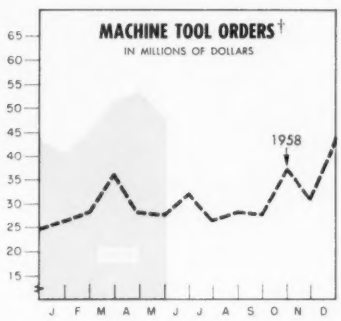
The big "if" in the industrial scheme is the steel situation. A long strike—more than six weeks—could put a temporary halt to skyrocketing trends. But it would be just that—temporary. A lesser walkout would only slow the advance a bit. But the end of almost any length strike would only serve to speed things again, and the average for the year as a whole would end up about as expected.

But there is no denying that a strike has its influences on certain segments of the economy. STEEL's industrial production index, which is partially based on steel output, dipped below the pre-Fourth of July level, mainly because of lower steel production leading up to the July 15 deadline. It registered



	Shipments		Backlogs	
	1959	1958	1959	1958
Jan.	224.3	316.7	1,794	2,778
Feb.	216.1	282.6	1,864	2,727
Mar.	260.5	336.6	1,873	2,542
Apr.	290.6	323.6	1,922	2,387
May	294.1	328.2	1,768	2,211
June	....	329.2	....	2,191
July	....	290.8	....	2,220
Aug.	....	298.0	....	2,119
Sept.	....	313.7	....	2,047
Oct.	....	307.1	....	1,913
Nov.	....	271.1	....	1,839
Dec.	....	266.6	....	1,809
Total	....	3,664.2		

American Institute of Steel Construction.



	New Orders		Shipments	
	1959	1958	1959	1958
Jan.	41,050	26,850	31,300	57,800
Feb.	45,400	28,300	36,050	48 050
Mar.	51 550	36,150	45,750	54,150
Apr.	53,200	28,300	45,000	50,900
May	48,100*	28,050	41,250†	50,100
June	.....	32,100	.....	45 500
July	.....	26,550	.....	29 700
Aug.	.....	28,300	.....	29,800
Sept.	.....	28,100	.....	34,900
Oct.	.....	37,000	.....	41,400
Nov.	.....	30 700	.....	33,650
Dec.	.....	43,900	.....	43,950
Totals	.....	374,300	.....	519,900

†Metal cutting and metal forming.
*Preliminary.
National Machine Tool Builders' Assn.

a preliminary 165 (1947-49 = 100) during the week ended July 11 despite strong support from auto production and generation of electric power.

Automakers are jubilant about the best summer sales since 1955. The daily average in June was 22,300 cars, the highest since September, 1955. After taking a breather over the Fourth, producers bounced right back to nearly match the weekly output rate prior to the holiday. Numerically, stocks are at a record level (above 900,000 units), but in terms of days' supply, they are still well within the industry's sales target.

Freight Traffic Up

One of the best ways to gage economic activity is to keep an eye on statistics dealing with movement of freight. And they leave little to be desired. Railroad freight carloadings have been holding about 14 per cent above year-ago levels. The regional shippers advisory boards of the Association of American Railroads estimate the edge will slip to 8.5 per cent in the fourth quarter, but this will reflect more the uptrend in 1958's second half than any decline for 1959.

Intercity truck tonnage so far this year is more than 20 per cent ahead of the 1958 pace. Barge traffic also holds an edge of better than 20 per cent over 1958's tonnage.

Trends Fore and Aft

- Bookings of material handling equipment in May were the highest since August, 1956, reports the Material Handling Institute Inc. The index hit 164.45 per cent of the 1954 average.
- Following declines in March and April from the all-time high set in February, orders for foundry equipment edged up to 157 (1947-49 = 100) in May, according to the Foundry Equipment Manufacturers Association.
- Heavy construction contract awards during the week ended July 9 totaled $578.4 million, the second highest weekly figure of the year, says *Engineering News-Record*. Industrial awards had the best week in 1959 and now stand at $1.5 billion for the year to date, 45 per cent ahead of the 1958 period.
- Sales worth $1.8 billion for the makers of electric motors and generators are predicted by NCO Consulting Service, New York. This would be a peacetime record.

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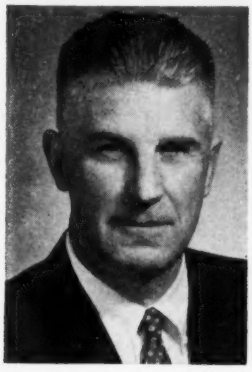

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GARDNER P. WILSON
joins Brush Instruments

CHARLES H. HALLETT
Allison Steel v. p.

ROBERT E. WILBERT
Eaton Axle eng. post

George F. Halfacre was elected vice president-manufacturing, **New Jersey Zinc Co.**, New York. He succeeds **Philip M. Ginder**, retired. He was manager of manufacturing.

Gardner P. Wilson heads the newly created Western Engineering Div., Los Angeles, **Brush Instruments**, a division of Clevite Corp. He formerly headed the western engineering branch of ElectroData Div., Burroughs Corp.

C. F. Mooney was elected president and chief executive officer of **D. S. Kennedy & Co.**, Cohasset, Mass. He succeeds **D. S. Kennedy**, now chairman. Mr. Mooney formerly was vice president and manager of structural and reinforcing steel sales of Flint Steel Corp. He helped form Anchor Metals Inc., Hurst, Tex., in 1953, and was its president.

Carl T. Nichols was made vice president, **Rolled Steel Products Corp.**, Los Angeles. He was manager of purchases and production.

Richard W. Miller, former vice president and district sales manager, **Columbia Tool Steel Co.**, Chicago, was named to the new post of vice president-general sales manager.

Francis J. Herman was made superintendent of open hearths at **U. S. Steel Corp's** Youngstown District Works.

Lawrence A. McDonald, sales manager, **Super Tool Co.**, a division of Van Norman Industries, Detroit, was elected vice president-sales.

Charles H. Hallett was appointed vice president-general manager, **Allison Steel Mfg. Co.**, Phoenix, Ariz. He assumes chief administrative responsibilities under W. L. Allison Sr., president. Mr. Hallet for the last four months served as assistant to the vice president and general manager at Kaiser Steel Corp.'s Montebello Fabricating Div. He formerly served for 18 years with Joseph T. Ryerson & Son Inc.

J. M. Potts was elected president of **Bonney Forge & Tool Works**, Allentown, Pa., and Alliance, Ohio, subsidiary of Miller Mfg. Co. He formerly served as vice president of Bonney, and general manager of its Pennsylvania operations.

George A. Medsker joined **Gasflux Co.**, Elyria, Ohio, as vice president-sales manager. He was with the sales organization of Nelson Stud Welding Co., a division of Gregory Industries.

Walter O. R. Korder, former general sales manager, **Whitney Chain Co.**, Hartford, Conn., subsidiary of **Foote Bros. Gear & Machine Corp.**, was appointed general marketing manager in charge of both Foote and Whitney operations.

Computer Systems Inc., New York, appointed **Thaddeus J. Kusto** director of research; **Milton M. Gerber**, chief engineer.

Edward R. Burkardt was elected vice president-tool sales, **J. H. Williams & Co.**, Buffalo, a division of United-Greenfield Corp. He was sales manager, Tools Div.

Robert E. Wilbert was promoted from methods and planning supervisor to chief industrial engineer, Axle Div., **Eaton Mfg. Co.**, Cleveland. He succeeds **R. A. Wieland**, recently named assistant plant manager, Marion Forge Div., Marion, Ohio. **Anton F. Fonda** succeeds Mr. Wilbert.

B. W. Moreland was elected vice president-manufacturing, **Copeland Refrigeration Corp.**, Sidney, Ohio. He was general manufacturing manager.

Reynolds Metals Co. created a new executive post at Richmond, Va., headquarters to co-ordinate efforts to obtain a larger share of the extrusion market, and selected **H. E. Miller** to handle the assignment. Mr. Miller was manager of the Phoenix, Ariz., extrusion plant, and is succeeded by **Russell V. Bobb.**

Jack C. Rogers was made sales manager, Speed Swing Div., **Pettibone Mulliken Corp.**, Chicago. He was assistant sales manager, Industrial Div., J. I. Case Co.

Lee J. Wolf was made executive vice president, **Massey-Ferguson Inc.**, Racine, Wis. He was vice president-administration and treasurer. He continues in the latter post.

Frederick W. Schulte was made St. Louis district manager, Engineering Works Div., **Dravo Corp.** He was regional manager in St. Louis for the Machinery Div.

James C. Nairn was named sales manager, **Canadian Duff-Norton**

R. K. McCONKEY

R. H. HOLSING

Timken Roller Bearing promotions

H. BEN YOUNG

WILBUR E. LUNGER

ACF staff vice presidents

Co. Ltd., Toronto. He succeeds **James Gilchrist**, retired.

R. K. McConkey was promoted to general manager, Industrial Div., **Timken Roller Bearing Co.**, Canton, Ohio. **R. H. Holsing** was named chief engineer, Rock Bit Div. **Wyn E. McCoy** succeeds Mr. McConkey as assistant general manager, Industrial Div. **A. E. Matejka** was named chief product engineer, and is succeeded by **C. L. George** as assistant chief product engineer. **G. L. Deal**, secretary-treasurer, was promoted to auditor.

David S. Soliday Jr. was named product manager-stainless steel in the Warehouse Div. of **Chase Brass & Copper Co.**, Waterbury, Conn.

William J. Cornelius succeeds the late **James J. Brady** as general manager, **A. B. Murray Co. Inc.**, Elizabeth, N. J. **Walter D. Cameron** succeeds the late **Lawrence Sherman** as treasurer.

Jay L. Taft Jr. was made New York district sales manager, **Eastern Stainless Steel Corp.**

John M. Butler Jr. was appointed sales manager at **General Electric Co.'s** Small AC Motor & Generator Dept., Schenectady, N. Y.

Charles A. Adams was made division manager, **Chainveyor Corp.** He has offices in Ellwood City, Pa., in charge of activities in Michigan, Ohio, West Virginia, western New York and Pennsylvania, as well as eastern Canada.

George Beckwell was made research and development engineer at **Pines Engineering Co. Inc.**, Aurora, Ill.

H. Ben Young was made staff vice president-engineering and research, **ACF Industries Inc.**, New York. **Wilbur E. Lunger** was made staff vice president-manufacturing. Both were officers in ACF operating divisions. Mr. Young was director of engineering and research at W-K-M Div., Houston. Mr. Lunger was vice president-manufacturing, American Car & Foundry Div., New York.

Samuel S. Johnson was made assistant superintendent of foundries, a new post at **Hamilton Foundry Inc.**, Hamilton, Ohio. He was with American Machine & Foundry Co. **John R. Puckett** was named customer service supervisor.

James L. West was named to succeed **Dr. Laurence E. Fogarty** as director of **Link Aviation Inc.'s** Binghamton, N. Y., laboratory.

Raytheon Co., Waltham, Mass., elected **David D. Coffin** group vice president-government. He was vice president and manager, Missile Systems Div. He is succeeded as division manager by **T. C. Wisenbaker.** Elected a vice president and continuing as manager, Government Equipment Div., is **Homer R. Oldfield Jr. E. Nevin Kather** was made manager, Microwave & Power Tube Div.

Donald W. Lininger was made assistant sales manager, **Beaver Pipe Tools Inc.**, Warren, Ohio. He assists **Russell Herig**, recently elected vice president-sales.

Electric Products Co., Cleveland, appointed **R. J. Berry** corporate vice president; **J. R. Williams**, vice president, Standard Products Div.; **John H. Kellogg**, vice president, Power Equipment Div.; **R. A. Morey**, treasurer.

Parker-Kalon Div., General American Transportation Corp., promoted **William Conover** from field sales engineer to regional sales manager, Chicago.

Richard H. McCarthy Jr. was made sales director for **Bradley-Sun Div.**, American Can Co., New York.

Trane Co., La Crosse, Wis., elected **William C. Dackis** and **William D. Graham Jr.** vice presidents, Sales Div.; **John D. Cantwell Jr.**, vice president-La Crosse manufacturing.

Robert L. Groves was made administrative assistant, Sales Dept., **Warner & Swasey Co.**, Cleveland. He was European district manager for the company in Paris, France.

Louis V. Abrams joined **Pangborn Corp.**, Hagerstown, Md., in the new post of administrative assistant to the president. He was plant manager of the Kelsey-Hayes Alloy Wing Plant, Clark, N. J.

Richard B. Quinn was made New England district manager, **Riverside-Alloy Metal Div.**, H. K. Porter Company Inc. He has headquarters in West Hartford, Conn.

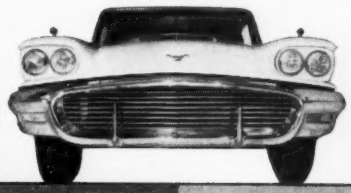
Hugh D. Clark, works manager of the Jamestown Div., was elected vice president of **Art Metal Construction Co.**, New York.

Robert C. Hepple was made marketing director, **Armour Alliance Industries**, Armour & Co., Alliance, Ohio.

John P. Davidson was made production control manager of **Chrysler**

.....Today the proudest cars on the road glisten with Olin Aluminum

The exciting Ford Thunderbird is an example. Quality Olin Aluminum is going into the manufacture of most of the fine new cars. Bright, light aluminum resists corrosion, won't rust. No other metal gives car owners such lasting satisfaction. Olin Aluminum, in its first year as a major producer, is already a basic source of supply for the great names in the automotive industry.



OLIN ALUMINUM

OLIN MATHIESON • METALS DIVISION • 400 PARK AVE., N. Y.

LEONARD P. SHELLEY
Pacific Switchgear mgr.

DR. HENRY ROSE
Plasteel research dir.

WILSON L. WEIR
J&L supt.-Detroit

LEE W. HEINZINGER
Bethlehem Pacific metallurgist

DAVID C. HAMMOND
American Electronics div. mgr.

GEORGE V. AGAJEENIAN
president of Univex

Corp.'s New Process Gear Div., Syracuse, N. Y.

Lee W. Heinzinger, metallurgical supervisor at **Bethlehem Pacific Coast Steel Corp.'s** Seattle steel plant for the last eight years, was appointed chief metallurgist.

David C. Hammond joined **American Electronics Inc.,** Los Angeles, as manager of its Electric Machinery & Equipment Div., which is primarily engaged in manufacture of ground support equipment for the military services. He was founder of Pacific Fabricating Co., which became Hammond Mfg. Corp. in 1944, and was purchased in 1954 by Air Logistics Inc.

Arthur E. Coburn was made sales manager of Electrodyne automatic valve operators for **Hupp Aviation Co.,** Chicago, a division of Hupp Corp.

Harold M. Priestley was made metallurgist with **Henry G. Thompson & Son Co.,** New Haven, Conn.

George V. Agejeenian was elected president, **Univex Die Cast & Engineering Co.,** Dearborn, Mich. He was vice president and general manager. He joined Univex in 1956, and formerly held management posts with Ford Motor Co. of Canada Ltd., Fort Die Casting Corp., and Studebaker-Packard Corp.

Carl T. Vangsness was made sales supervisor for Scotch-Shield, aluminized fabric of **Minnesota Mining & Mfg. Co.'s** Reflective Products Div., St. Paul.

Donald E. Stocking was made eastern regional manager, Philadelphia, of **Consolidated Electrodynamics Corp.** He succeeds **Max Garber,** recently made director of marketing, Rochester Div.

J. Calvin Brantley was appointed assistant director of research for **Union Carbide Nuclear Co.,** division of Union Carbide Corp. He is at the Sterling Forest Laboratories near Tuxedo, N. Y.

Leonard P. Shelley was appointed manager, **Pacific Swichgear Div.,** San Francisco, Federal Pacific Electric Co. **Robert L. Lemman** was named manager, North Pacific sales region. A vice president of Federal Pacific since 1957, Mr. Shelley has served for the last five months as acting divisional manager.

Dr. Henry Rose was made director of research of **Plasteel Products Corp.,** Washington, Pa., and its subsidiary, Laurel Research Corp. He was in charge of resin development at Crosby Chemical Corp., DeRidder, La.

Wilson L. Weir was appointed superintendent, Cold Finish Dept., at **Jones & Laughlin Corp.'s** Stainless & Strip Div. plant at Detroit. **Andrew E. Engelbert** was made assistant superintendent.

Timken Roller Bearing Co., Canton, Ohio, promoted five to posts in its International Div.: **S. C. Partridge** advances from general manager, Industrial Div., to director of sales, International Div. **John B. Baker,** former chief product engineer, was made chief engineer. **J. R. Wible** was made general auditor; **Edward H. Hughes,** manager of sales planning, Domestic and International; **Charles L. Richey,** manager of production planning, Domestic and International.

John O'Connor III, former assistant Cleveland district sales manager, **Copperweld Steel Co.,** Steel Div., was named manager of the new Pittsburgh district office at 1107 Peoples East End Bldg., 6008 Penn Ave.

Tullio Tognola was named an assistant director of engineering, **Scintilla Div.,** Sidney, N. Y., Bendix Aviation Corp.

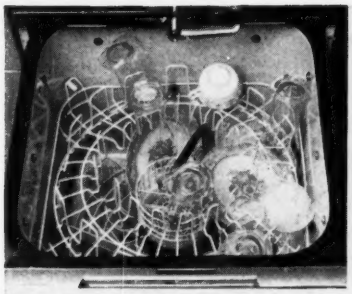
OBITUARIES...

David H. Daskal, 70, president and founder, **Perfection Gear Co.,** Harvey, Ill., died July 5.

Edward H. Sturm, 41, president and treasurer, **L. M. & S. Tool, Die & Engraving Inc.,** Buffalo, died July 3.

Maurice G. Wordingham, 69, president, **Phoenix Products Co.,** Milwaukee, died July 2.

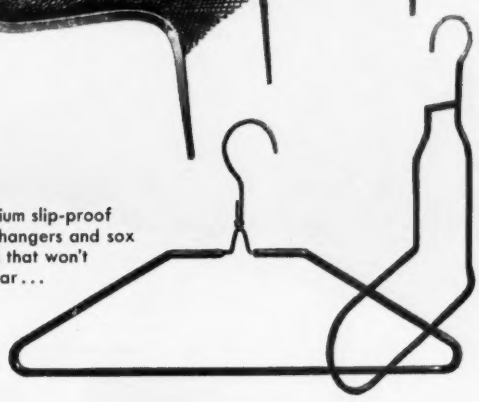
NEW WAY TO UPGRADE YOUR PRODUCTS: VINYL COATINGS



This lustrous vinyl-coated rack resists the scalding water and detergents of automatic dishwashing, prevents clattering and chipping of delicate china.

For bassinets, metal play pens, children's furniture...

For soft, colorful seating... for table tops...



For premium slip-proof garment hangers and sox stretchers that won't rust or tear...

For leather-like stair-well filler, protective screening...

Colorful, leathery coatings for wire and expanded steel

Tough leather-like coatings of vinyl can create profitable new markets for you with wire and expanded steel products. Colorful coatings up to 1/16" (60 mils) thick can be deposited on heavy wire, rod stock, or expanded steel in *one dip*. Or by *spraying* it on.

You can make the elastomeric coatings soft and rubbery—or as hard as tire casing. Make the finishes glossy, matte, or even *crinkled*. And in any color you choose. The characteristics of the final coating are determined by the formulation. After spray or dip application, a short heat cure "sets" the resin and permanently bonds it to the metal.

Write for sources of vinyl in liquid form for coating metal, glass, or wood. Get a head start on investigating the new, profitable ways to use wire and expanded steel—vinyl coated for resilience, color and premium appearance. Write today!

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MONSANTO CHEMICAL COMPANY
Dept. SP-1, St. Louis 66, Missouri

Monsanto manufactures a wide variety of plasticizers and Opalon® resins for formulators of these high-quality vinyl dispersions.

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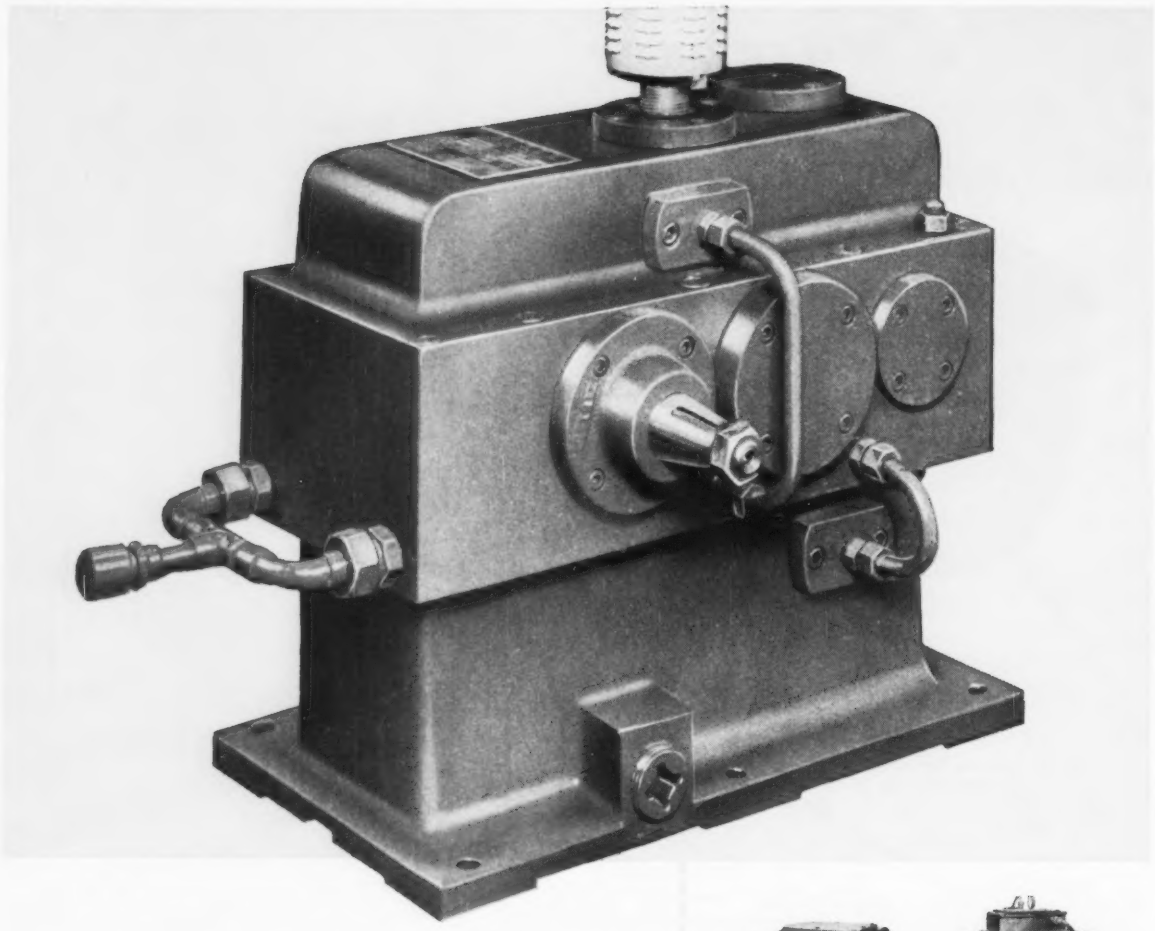
Where Creative Chemistry Works Wonders for You

100,000 RPM FOR A TEST STAND



Another example of Farrel's ability to meet extraordinary gearing requirements

The speed increaser shown above—built for operation at 100,000 rpm—is only one of the scores of highly specialized test-stand units designed and built by Farrel. Three other examples are shown at the right. Each was individually engineered to customer requirements.

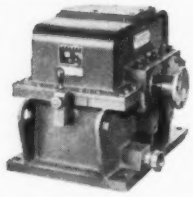
This experience offers virtual assurance of the ability to solve your high-speed gearing problems. The next time you need a test-stand unit, call Farrel. In the meantime send for a copy of bulletin 451.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

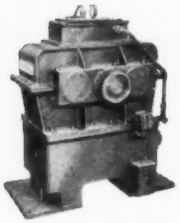
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Fayetteville (N. C.)
European Office: Piazza della Republica 32, Milano, Italy

FARREL

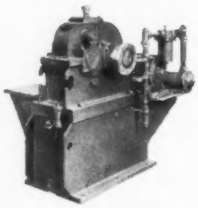
FB-1164



Special 375 HP speed-increasing unit, with two speed ranges, 6,000/10,769 RPM and 6,000/15,100 RPM.



Special DD-9 speed-increasing unit, 660 HP, input speed range from 1,500 to 3,000 RPM, output speed range from 20,000 to 40,000 RPM.



Special SI-825 speed-increasing unit, 150 HP, 3,000 to 5,000 input RPM, with 3 gear-set ratios—1:7.971, 1:2.5091, 1:1.0127.

CF&I To Spend $21 Million

DETAILS of the $21 million program of expansion, diversification, and modernization of plants and properties of Colorado Fuel & Iron Corp., Denver (STEEL, July 13, p. 82), have been released.

About $18 million will be for expenditures at the Western Div. plants at Pueblo, Colo., and Oakland and South San Francisco, Calif. Balance of the funds will be used for improvements and new equipment at the Wickwire Spencer Steel Div., Buffalo Plant, Tonawanda, N. Y., and other properties.

• **Pueblo Plant** — This plant will benefit from an expenditure of about $16.6 million. It will cover:

1. An $8 million oxygen steel converter with a capacity of 50,000 ingot tons a month.
2. A heavy duty cooling bed at the 25 in. mill to increase capacity and efficiency in the production of structural steel and in rolling billets, tube rounds, and similar sections. The structural steel section capacity will be raised 132,000 tons a year.
3. Improvements in the mechanical and functional operation of the 14 in. mill will increase its capacity by 12,000 tons of product a year.
4. The wire mill capacity for high carbon wire and wire products will be increased 11,000 tons a year.
5. New facilities will be added for the manufacture of welded wire fabric.
6. Miscellaneous improvements for the rod mill and other facilities.
7. Power facilities will be increased, including installation of a 69,000 volt loop transmission and distribution system costing $2.2 million.

• **South San Francisco Plant**—New wire drawing machines will be installed at cost of $1.1 million.

• **Oakland Plant**—New welded wire fabric equipment will be installed and hardware looms will be converted to bobbinless operation.

Installs Oxygen Unit

A new storage and distribution installation to supply gaseous oxygen for shape-cutting of steel has been placed in operation at Erle M. Jorgensen Co.'s steel service center at 700 Pennsylvania Ave., San Francisco, Calif. The unit was manufactured by Linde Co., a division of Union Carbide Corp., New York.

Opens Steel Wheel Plant

Canadian Steel Wheel Ltd., Montreal, Que., has formally opened its $12 million steel wheel plant in that city. Its rated capacity is 200,000 wrought steel wheels a year. The plant contains 160,000 sq ft of floor space and is a completely integrated operation—from steel melting to forging and rolling, heat treating, machining, inspection, and testing. Kendall Contracting Inc., Alliance, Ohio, was the engineer for the entire project, having prepared the initial layouts, designed many of the special material handling devices and producing tools, and coordinated the engineering of the equipment suppliers.

Installs Extrusion Press

Aluminum Co. of America, Pittsburgh, will install a 5200 ton capacity extrusion press at its Vernon, Calif., Works. The new facility, heart of a $5 million expansion program, will be ready for operation early in 1960. A 750,000 lb capacity stretcher was installed as part of the program last year. Combined operation of the press and supporting equipment will enable Alcoa to extrude, heat treat, and stretch aluminum alloy shapes up to 34 sq in. is cross sectional area. The program also includes an expansion of forging operations and modernization and streamlining of casting facilities.

May Enter Missile Field

Pratt & Letchworth Div., Dayton Malleable Iron Co., Buffalo, has ordered production equipment as the first step in a diversification program that may see the firm enter the missile and aircraft field. The division soon will start using ceramic molding instead of sand molding to cast steel parts, enabling it to produce the close tolerance products demanded by the missile and aircraft industries. The division also has ordered electric furnace steel melting equipment for installation at the plant. Initially, about $100,000 will be spent on the equipment. If the furnaces are acceptable, the outlay will be increased to about $250,000. Installation of the equipment will start next month.

Enlarges Appliance Plant

Norge Div., Borg-Warner Corp., Chicago, has launched a $950,000 expansion of its range and home laundry plant at Effingham, Ill. The 139,250 sq ft addition will add 33 per cent to available manufacturing and assembly floor space. A $258,000 addition was started in March at the Herrin, Ill., automatic and wringer washer factory.

H & B Buys Aircraft Div.

United States Chemical Milling Corp., Manhattan Beach, Calif., purchased the Aircraft Div., H & B American Machine Co. Inc., Chicago, and will operate the property as its American Machine Div. This strengthens USCM's position as a major factor in the subcontract machining of missile and aircraft components. The new facilities provide USCM with 110,000 sq ft of manufacturing space in Indianapolis and 60,000 sq ft in Culver City, Calif.

Shifts Plant Schedules

Plants of National Supply Co., Pittsburgh, at Gainesville and Houston, Tex.; Torrance, Calif.; and Ambridge, Pa., will take on additional operations as a result of a decision to close the company's plant at Toledo, Ohio. Transfer of machinery from Toledo will be accomplished during September.

A 48,000 sq ft building will be added to the Gainesville plant which will make slush pumps and triplex pumps in addition to its present line of pumping units. The Houston plant will be enlarged to take on the production of fluid end parts for slush pumps in addition to wellhead equipment. A production line for tool joints will be transferred to the company's seamless tubular products mill at Ambridge, Pa., where drill pipe is manufactured. The Torrance plant will take over

the production of small and medium sized drilling rigs, now being made at Toledo. It is now making larger rigs.

Expands Houston Plant

Chicago Bridge & Iron Co., Chicago, will erect a building to house the Houston plant's fabricating and erecting equipment. The firm will also add a pickling facility which will be used to remove excess mill scale from steel plates and shapes utilized in the fabrication of large storage vessels and processing equipment. This construction will complete a $1 million expansion program started two years ago.

Aeroquip Corp. Expanding

Aeroquip Corp., Jackson, Mich., has launched a $2.4 million capital expenditure program to cover the next 18 months. It will provide 140,000 sq ft of working area and includes these projects: At Jackson, a larger plant for the Elbeeco Div., an extension of the Jackson Div. plant, and a special laboratory for testing products used on rockets, missiles, and other advanced applications to be operated by the Engineering Center; at Van Wert, Ohio, an addition to the Industrial Div. plant; at Burbank, Calif., new production facilities at the Western Div.; and at Los Angeles, a new engineering center for the Marman Div. The firm makes flexible hose assemblies, fittings, couplings, clamps, straps, bands, load control and cargo tie-down equipment.

Constructs Canmaking Unit

Construction is underway on American Can Co.'s canmaking plant on Lake Mirror Road, Atlanta. The multimillion dollar facility will contain 150,000 sq ft of floor area and will have a rated annual capacity of nearly 400 million metal cans and composite metal-paper containers.

CONSOLIDATIONS

Two divisions of Van Norman Industries Inc., New York, **Van Norman Machine Tool Co.**, and **Van Norman Automotive Equipment**, have been consolidated into one firm, Van Norman Machine Co. Officers include: President, Paul W. Leming; and executive vice president-sales, Selby F. Greer.

Caine Steel Co., Chicago, acquired **Dumas-Caine Steel Co.**, Atlanta, and will operate the property as its Atlanta Div. A 16,000 sq ft addition is being erected at the steel service center at 1315 Chattahoochee Ave. N.W., Atlanta, Ga.

Wm. K. Stamets Co., Pittsburgh, merged with its wholly owned subsidiary, **Enterprise Co.**, Columbiana, Ohio, and will operate the property as the Enterprise Div. The company makes machine tools and special machinery. Executive offices, sales operations, and the Machine Tool Distributor Div. will be centered at Pittsburgh. The engineering and manufacturing operations will be combined at Columbiana under the direction of A. H. Long, vice president.

Chiksan Co., Brea, Calif., purchased **Hamer Valves Inc.**, Long Beach, Calif. Chiksan is a subsidiary of Food Machinery & Chemical Corp., San Jose, Calif., and makes swivel joints, tank car and tank truck loading equipment, and barge and tanker loading systems.

ASCO Supply Co., West Haven, Conn., purchased **Noera Mfg. Co.**, a division of Chase Brass & Copper Co., Waterbury, Conn. The new owner purchased the machinery and equipment and has taken a five-year lease on the land and buildings, with an option to buy at any time within that period. ASCO manufactures polishing and cleaning compounds and chemical specialties. Noera produces tire pumps, grease guns, metal oilers, inflators, and allied articles.

Vulcan Materials Co., Birmingham, acquired **Ralph E. Mills Co.**, Frankfort, Ky., and **Talbott Construction Corp.** and **Talco Constructors Inc.**, Winchester, Ky. The three companies are frequent participants with other leading construction firms in joint venture, heavy construction projects, such as bridges, hydroelectric dams, railroad tunnels, air bases, and highways.

NEW OFFICES

Alan Wood Steel Co., Conshohocken, Pa., opened a district sales office at 824 Boylston St., Chestnut Hill (Boston), Mass. Edward H. Lloyd Jr. is district manager.

Acme Industries Inc., Jackson, Mich., opened a direct factory sales office at 2386 E. 290th St., Wickliffe (Cleveland), Ohio. The firm makes air conditioning and refrigeration systems.

NEW ADDRESSES

Brisk Waterproofiing Co. and **Brisk Metal Products** moved its plant and established offices at 720 Grand Ave., Ridgefield, N. J. Offices will be maintained at 103 Park Ave., New York.

Sylvania Electric Products Inc. moved its executive offices to 730 Third Ave., New York 17, N. Y. Other Sylvania offices remain at 1740 Broadway, New York 19, N. Y.

NEW PLANTS

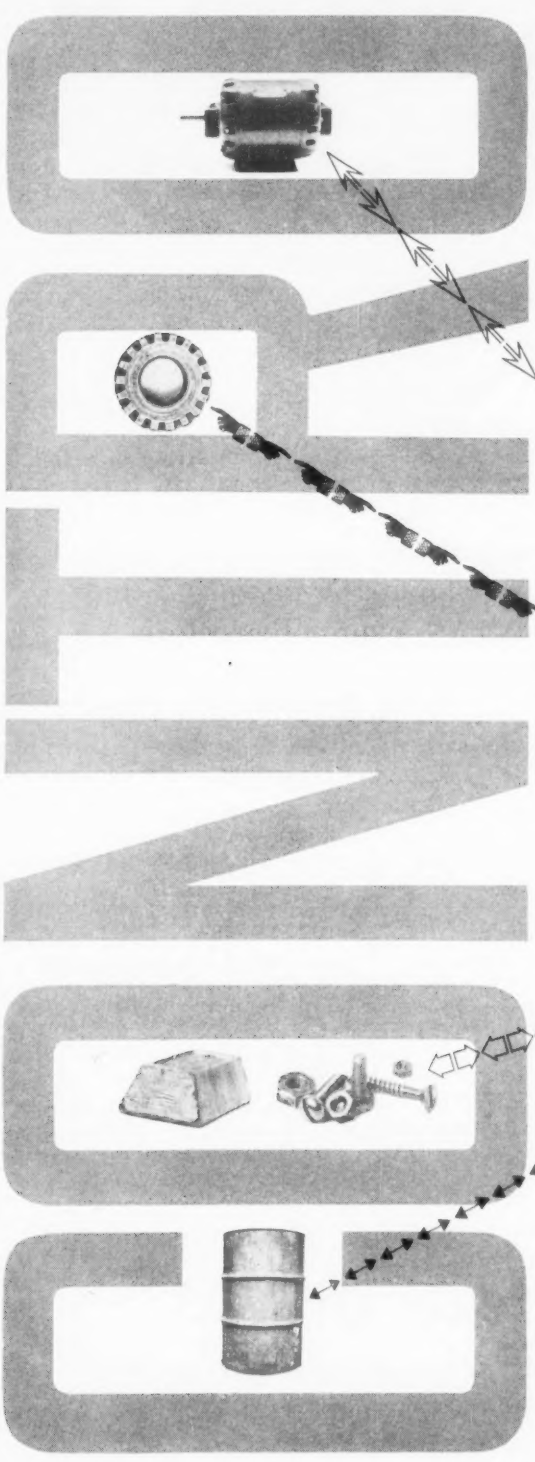
Textron Metals Co., a division of Textron Inc., New York, opened its new facilities in Pottsville, Pa. The 112,000 sq ft headquarters plant is equipped to produce aluminum windows and doors, siding, and other building products.

Bassick Co., Bridgeport, Conn., opened a 110,000 sq ft plant at Spring Valley, Ill., for the production of furniture and equipment casters.

Continental - Diamond Fibre Corp., a subsidiary of Budd Co., Newark, Del., opened an integrated warehouse, sales and engineering headquarters at 2600 Santa Fe Ave., Los Angeles. Edgar Davis is supervisor of the operation.

Waterbury Rolling Mills Inc., Waterbury, Conn., opened a sales office at 2000 Lee Rd., Cleveland 18, Ohio. Douglass L. Burnham is manager.

INVENTORY



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With new IBM inventory control methods, you not only answer questions like these precisely, but you also keep inventories at optimum levels . . . reduce shortages . . . cut inventory carrying charges . . . get automatic calculation of materials requirements and ordering quantities.

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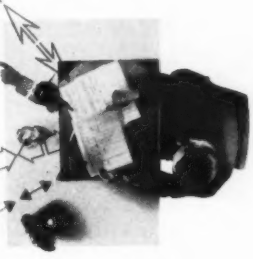

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DATA PROCESSING

Philadelphia Gear announces...

a major breakthrough to new standards in precision grinding of speed reducer gearing... *So advanced* that conventional standards of accuracy have suddenly become out-of-date. *So significant* that you can solve drive problems you could never solve before... because you get engineering advantages that have never been available before.

IMPROVED ACCURACY

For the first time, standard commercial speed reducers are available with gearing of master gear quality.

LONGER LIFE

Extreme accuracy of profiles, profile spacing and surface finish completely eliminates "running in" periods and resulting wear on gearing.

REDUCED BACKLASH

Precision ground gearing means reduced backlash for reversing drives... plus uniform backlash where precision of movement is important.

100% INTERCHANGEABILITY

Duplicate units or spares can be installed with original manufacturing tolerances duplicated exactly.

SPACE AND WEIGHT SAVINGS

Use of harder materials plus reduced load factors save weight and space without sacrificing performance characteristics.

REDUCED VIBRATION

Reduced tooth to tooth errors, accumulated pitch errors and total composite errors give smoother contact.

HIGHER SPEEDS

Dynamic load factors are materially reduced. Reducers can operate at higher speeds... have increased load carrying capacity.

REDUCED NOISE

For any application where low sound levels are important, gearing noise is no longer a controlling factor.

IMPROVE YOUR PRODUCT

Philadelphia precision gear drives may give your product the years-ahead competitive edge you've been looking for.

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Technical Outlook

July 20, 1959

BETTER FLAME HARDENING— Rails and similar continuous shapes can be hardened with less danger of flaking by a new method of applying flame. It was developed by the Shell Development Co., New York. An auxiliary flame follows the underside of the rail while the main one handles the topside. The top hardening flame is followed closely by a water quench which gives a hardness several thousandths of an inch deep.

HOT ADHESIVES— A Washington source tells us that polymer chemists have good inorganic adhesives that withstand 900 or 1000° F. He claims they have opened the door to a new series of adhesives which will be good well above 1000° F. They should be ready within the next three to five years.

GASKET PIPE JOINTS—Rubber gaskets make a cheaper joint than welding for pipes 36 to 120 in. in diameter, says Kaiser Steel Corp., Oakland, Calif. Fast installation and unlimited service are claimed. Joints depend on a steel spigot ring which is welded to the pipe.

NEW AUTO GENERATOR— An experimental, heavy duty generator for trucks operates at 14,000 rpm and contains its own rectifier. The new design uses aluminum to reduce armature weight and increase its speed.

MORE SCRAP FOR L-D— You can use half scrap, half hot metal with Kaiser's new method for its L-D process. It increases the versatility of the process, says Kaiser Engineers Div., Henry J. Kaiser Co., Oakland, Calif.

CHANGING ROLLING TECHNIQUE—Refractory metals like tungsten and molybdenum may require radically different approaches in fabricating sheets and plates, says National Academy of Sciences, Washington. One suggestion: They may have to be continuously cast in a sheet, like glass, and rolled while still partially molten. (The entire process must be protected with an inert gas.)

RAPID INSPECTION—Brazed honeycomb is checked and the results recorded at production speeds by a new system announced by Magnaflux Corp., Chicago. A thermographic method, it is said to reproduce exactly and permanently every good bond between core and skin.

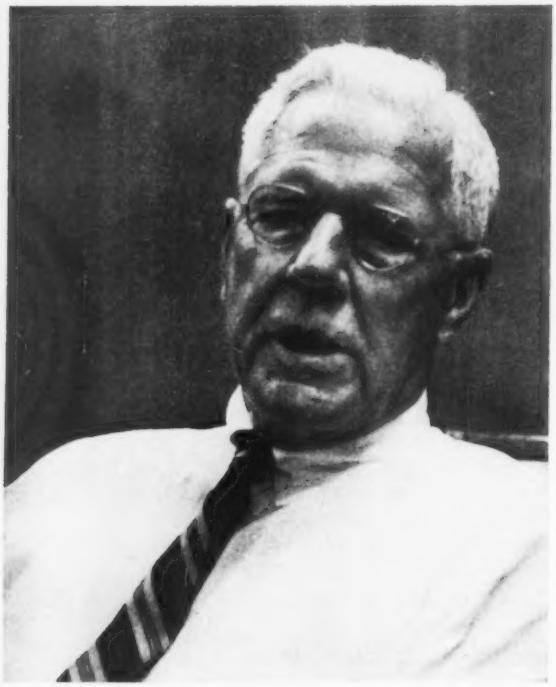
NEED BETTER SKYHOOK— Do you know a good way to coat fine metallic fibers with a refractory? The technique is needed to make fabrics for parachutes which can withstand 1000 to 1500° F during the re-entry of space capsules. Uncoated, fine mesh samples of metal fabrics burn when touched by a match.

QUICKIE HARD CHROME— An improved technique puts a film of hard chrome on metal almost instantly, says its developer, Michrom Inc., a division of Gits Bros. Mfg. Co., Chicago. It is said to be dense and free of voids. Another advantage: Absence of hydrogen embrittlement.

MAKING REPAIRS WITH CERMETS— Coating metals with cermet powders is gaining popularity. Many maintenance and repair firms are adding the process to their production lines. Truck engine valves, cylinders, and exhaust ports are said to be the chief applications.

SPACE AGE JOINING PROBLEMS—How do you join thin sheets of tungsten or molybdenum to stainless steel when both may be covered with a ceramic material? The Air Research & Development Command, Washington, wants to know. It's a number one problem in making tomorrow's manned aircraft—wing leading edges may be pure tungsten coated with a ceramic, it says.

Are Too Many Tests Hurting Welding?



YES says James F. Lincoln, chairman, Lincoln Electric Co., Cleveland

"The present welding standards have resulted not only in increased cost in examining welds to see that they come up to the written standards, but more than that, they have created suspicion in the minds of those who are not fully informed on the virtues of welding. This limits its use to a point far below what would be done if welding were understood and accepted as it should be.

Arcwelding has been in commercial use for a good deal more than a generation. It is accepted as the only commercial way that metals can be joined and have full strength in the joint. It is accepted now by all engineers if full joint strength is required.

The record that arcwelding has made certainly should bring about a revision of the present standards which have increased the cost of its use enormously. Because of the cost and consequent suspicion of welding that unnecessary tests produce, the use of welding has been eliminated in many places where it could be of tremendous service. Its application in buildings, bridges, and the redesigning of machinery would save many billions of cost that old designs and methods now necessitate.

The present rules, which are limiting the use of welding, make all tests in stress areas where the joint never could be used. They make no tests in the areas where the joint will be used. All welds are tested to the ultimate, which would be at least

CASE FOR FEWER TESTS

A MAJORITY of the authorities interviewed by STEEL agree that welding could be helped by limiting the amount of nondestructive testing required. The editors found that these are the main points:

- Many welding requirements are discouraging this type fabrication.
- The bulk of structural welding does not require expensive inspection techniques.
- The effects of common structural defects are exaggerated.
- Most of this country's weldments are overdesigned.

The experts are most disturbed by the engineer who lacks an adequate background in welding and seeks to cover his tracks by overdesigning and specifying some form of nondestructive test.

G. R. Rothschild, assistant director of metallurgical research, Air Reduction Co. Inc., New York, puts some of the blame on authors of current metallurgical books who propagate an ancient misconception that welding is questionable.

One testing laboratory takes a poke at unscrupulous manufacturers that employ welded designs without adequate knowledge of what constitutes a good weld. Welding standards, the laboratory says, have to be stricter than necessary to protect the innocent buyer (who also knows too little about welds).

• The experts agree that a change in testing specifications would be good.

Few experts feel we need to test structurals. Here is a typical attitude: "None of us wants to speak disparagingly of x-ray, fluoroscope, dye penetrants, and the like. But the thing has gotten completely out of hand, especially with regard to mild and structural steels," says G. A. Firestone, general manager,

(*Please turn to Page* 86)

Nearly two-thirds of the authorities queried by STEEL are in favor of fewer nondestructive tests and more common sense. Here are their opinions and a suggested remedial program

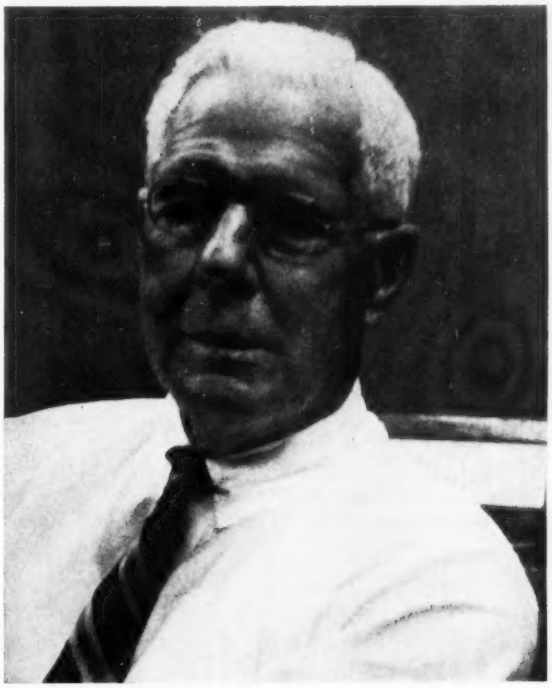
four times the stresses that actually would be used in production. No mechanical joint could pass any of these tests.

Another area in which welding is put under costly investigation is in the matter of porosity. It has been proved by research so that it cannot be doubted that as long as the porosity is not more than 7 per cent of the volume of the weld that there is no change in the strength or ductility of the weld. Such porosity is far beyond what is found in usual commercial welding operations.

In spite of these facts, many welds are x-rayed and if any porosity is found, the weld is chipped out and re-welded. The cost of this operation is more than the cost of the original welding.

A new view should be taken of welding standards. The metal which is deposited in a weld is much better than the parent metal that it joins. (It has been rolled from an ingot that is far from a perfect structure compared with the deposited weld metal.) A welded joint of the same dimension and analysis as the parent metal in mild steel is always superior in strength to the parent metal; so weld metal of the same analysis as the parent metal will always be stronger than the parent metal that it is joining.

Why shouldn't welding be accepted without question, as is now done with mechanical joints which cannot under any condition be of full strength of the parent metal? The economy cannot allow the waste inherent in our present welding inspection policies to continue to eliminate the savings and the advantages that welding can contribute.



CASE AGAINST FEWER TESTS

EXPERTS like J. J. Chyle, director of welding research, and R. J. Keller, chief engineer, Welding Products Div., A. O. Smith Corp., Milwaukee, flatly say we cannot relax our standards and establish lower ones. Their reasons: It is difficult to determine service requirements. Mr. Chyle says: "Considerable progress has been made in the last two decades in improving weld quality. Any change from present standards would result in a condemnation of welded fabrication as a method."

Mr. Keller concurs: "I believe specifications should be practical, but nondestructive tests are necessary to insure weld quality."

Orville T. Barnett, assistant director, metals research, Armour Research Foundation, Chicago, takes this view: "It is too simple to say we demand more weld quality than many services require. How much porosity can a weld stand? Even the tiniest crack might lead to catastrophe.

"We need to define such things better."

There is also some disagreement about visual testing. At a shipyard, welds in some plates looked so horrible inspectors thought they had run into sabotage. But cruciform tests of the fillet welds in $\frac{1}{4}$ and $\frac{3}{8}$ in. structural plates produced no weld failures. "The moral is this," says Clarence E. Jackson, associate manager, electric welding development, Linde Co., division of Union Carbide Corp., Newark, N. J., "much of our welding engineering is based on appearance standards. The average person judging on that basis fails to realize the important mechanical and metallurgical soundness which has been built into the application.

"You can't judge by visual standards alone."

Acme Welding Div., United Tool & Die Co., West Hartford, Conn.

Dr. D. C. Smith, chief metallurgist, Electrode Div., Harnischfeger Corp., Milwaukee, echoes that view. "I feel the bulk of structural welding today does not require expensive x-ray inspection. I know of no serious failures in our own products, yet our method of inspection is relatively simple—visual examinations, control of weld size, and an occasional spotcheck with x-ray."

Take porosity. Many specifications practically ban it. Yet tests show that porosity in deposits laid down by one of the commonest electrodes (E6012) may be beneficial rather than harmful. (The pores may be stress relievers.)

Engineers too frequently are inconsistent with their own goals. "Why," asks one contractor, "does someone require an x-ray of a braze or weld yet totally ignore the parent plate or sheet?" The same specifications often call for perfection in welding, yet permit parent metal defects of up to 15 per cent.

That kind of thinking drips over into related areas. One expert, familiar with submarine construction, says that considerable effort is expended in the determination and elimination of laminations in plate materials, yet for some applications where stresses are parallel to the plate surface, laminations make little or no difference.

Another instance (ultrasonic inspection of thick plates) is cited by Robert J. Kriz, welding consultant, Herron Testing Laboratories Inc., Cleveland. One purchaser demanded that the defects be cut out of the plates and repaired. Later he found that the defects were well within accepted mill standards.

"I just talked with our x-ray lab which has received a requirement from the Atomic Energy Commission," he continues. "Penetrameters (they define sensitivity) must have a 1 per cent sensitivity instead of today's 2 per cent. While I believe that the best is none too good in atomic energy work, other unrelated government agencies are already including that little requirement. Such a thing is absurd."

• Most authorities favor good inspectors, visual examination, and occasional nondestructive tests.

John Mooney, engineering department, United States Testing Co. Inc., Hoboken, N. J., says: "The major variable in welding is the operator. He is not usually proficient in all metals, so that the urgent need for testing and inspection rests primarily on the need to test his ability."

Mr. Firestone lists these attributes of a good welding inspector and claims that they are adequate for most structural applications.

1. A good inspector worries most about penetration. He wants to see inside and out, or top and bottom.
2. On heavy gages he wants to see proper scarfing.

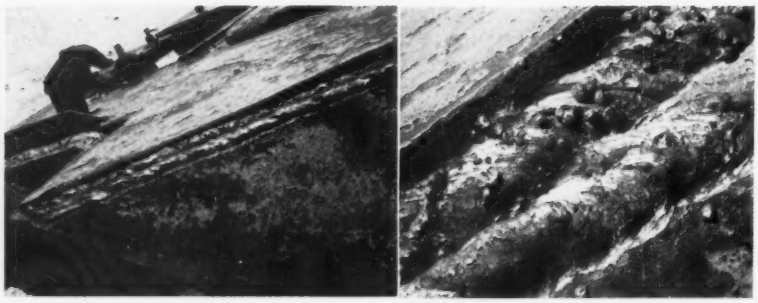
• Regardless of the side taken, most of our authorities make it perfectly clear that nondestructive testing has a legitimate, acceptable role in assuring weld quality in critical locations such as nuclear reactors, or pressure vessels.

In addition, most say that some tests are necessary to keep the welding operator on his toes.

These Welds Are Good Enough

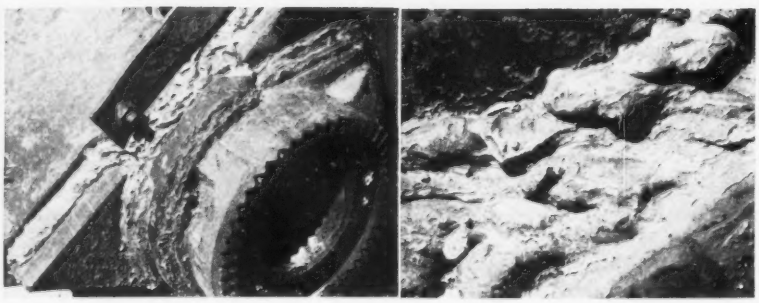
BODY JOINT

Plate isn't shaped to fit; there is no chamfer; and weld metal was barely warm



FRONT SPROCKET SUPPORT

It's hard to describe, but visual examination shows no apparent cracking. It withstood extraordinary abuse



They also emphasize the fact that there can be no simple solution.

A Suggested Program

R. David Thomas Jr., president, Arcos Corp., Philadelphia, points up a major stumbling block in structural steel welding when he says: "So many editorial comments and speeches treat broad generalities. The men who have to be convinced sit at desks in large insurance companies or in our state capitols. Such people aren't going to be convinced by anything less than carefully conducted experiments which demonstrate that fewer tests will reduce costs without risk."

In analyzing the pros and cons, one fact seems to stand out: No one agrees what present standards and specifications mean in terms of cost or safety. Any program ought to start with that premise.

With that in mind, here is a plan:

1. Set up a research program to test structures and define the degree of quality to match a given kind of testing.

2. Work closely with colleges of engineering to provide simple literature of a scholastic nature to implement the education of undergraduates and spell out what weld strength really is.

3. Find a way to document the difference in cost between, say a gravel bin welded properly then tested nondestructively, and one welded properly but not tested.

4. Re-emphasize the safety feature of welding—even a poor operator can make a satisfactory weld with today's equipment.

A final point: Such a program takes funds. Why not let the Welding Research Council or the American Welding Society be the recipient?

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

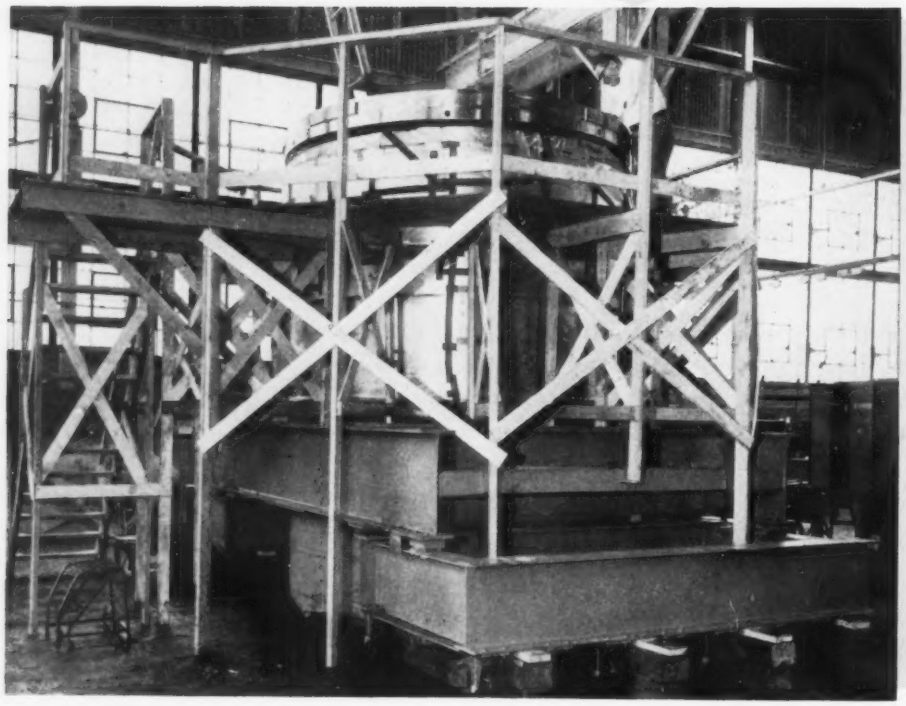
These authorities contributed their ideas and opinions to this article: Orville T. Barnett, assistant director, metals research, Armour Research Foundation; J. J. Chyle, director of research, A. O. Smith Corp.; G. A. Firestone, general manager, Acme Welding Div., United Tool & Die Co.; E. H. Franks, chief welding engineer, Electric Boat Div., General Dynamics Corp.; Clarence E. Jackson, staff engineer, Linde Co., a division of Union Carbide Corp.; R. J. Keller, chief engineer, Welded Products Div., A. O. Smith Corp.; Robert J. Kriz, welding consultant, Herron Testing Laboratories; John Mooney, engineer, U. S. Testing Co. Inc.; Fred Plummer, national secretary, American Welding Society; G. R. Rothschild, assistant director, metallurgical research, Air Reduction Co.; Dr. D. C. Smith, chief metallurgist, Electrode Div., Harnischfeger Corp.; R. David Thomas Jr., president, Arcos Corp.; Ray Stitt, research and welding engineer, R. C. Mahon Co., Detroit.

Would you like to tell us how you feel about weld testing? Write, Editor, STEEL, Penton Bldg., Cleveland 13, Ohio.

Although they look as if they were laid with a trowel, appearance may be the only drawback of these Russian welds. They withstood battle, a 14,000 mile trip, and repeated bombardment at Naval Ordnance Testing Station, China Lake, Calif.

Special Machine Knowhow Aids Builder on Reactor Job

Manufacture of reactor components is bound to be an expanding field for metalworking. It can bring some knotty problems. This is a case history



Snyder built this wood platform and steps to drill radial locating and vent holes in the stainless steel shell and to provide easy access to the top of the 12 ft high part

MAKING components for nuclear reactors can become a growth field for many metalworking companies, but the business takes specialized knowhow. It also requires some unorthodox solutions to difficult problems.

Take the case of the rotating shield plug for the Enrico Fermi reactor which is being built by the Power Reactor Development Co. on the shore of Lake Erie near Monroe, Mich.

The plug is about 9½ ft in diameter, 12 ft high, and weighs about 120 tons. It is filled to a depth of 7 ft with 3600 cans of graphite and borated graphite to act as the biological shield between the reactor and the operating floor. In the reactor, the plug rotates on ball bearings to provide remote control of fuel element handling.

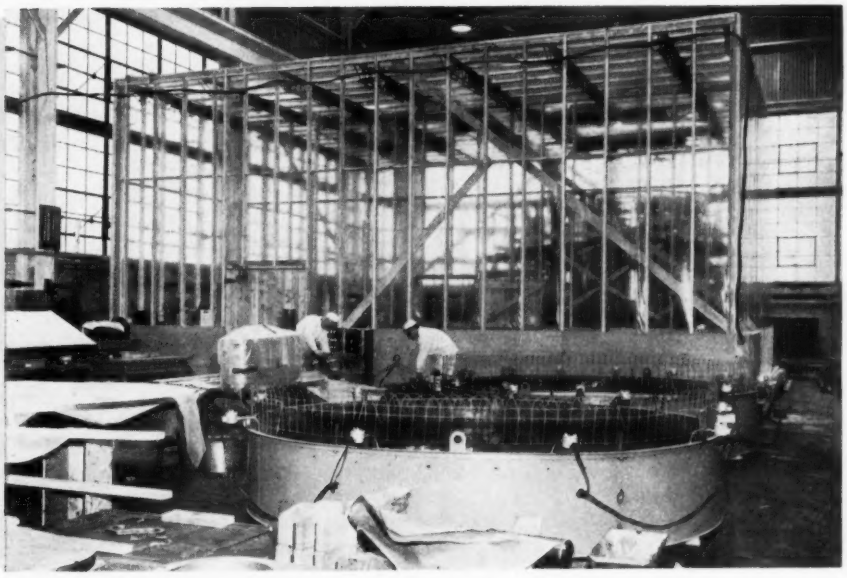
• **Builder Wins Bid**—Snyder Corp., Detroit, got the contract (based on competitive bids) to do several machining operations on the 40 ton stainless steel plug shell and to assemble a variety of components for the plug unit.

Delivery time was critical since a delay in receipt of the plug would hold up the production schedule at the reactor site.

Project time at Snyder (14 weeks) was delayed one week because modifications were made to fulfill the protective requirements of the plug.

• **Two Chiefs**—Howard Maynard, president of Snyder, assigned a full

Layout man locates radial holes from inside the part, using a surveyor's transit to pinpoint hole center lines. The holes then were drilled with a special rig (below). The electric, hand-fed drill unit is mounted on a special center post. Hole locations had to be held to ± 0.005 in.



This temporary cleanroom (in background) was used for assembly operations because of cleanliness, humidity, and temperature control requirements. The frame is wood; the covering is an airtight plastic sheeting

Seven layers of these square cans had to be assembled inside the reactor plug in precise patterns. Here an operator fills the spaces between the cans with cold rolled steel bars. All workmen wore white smocks and caps while in the cleanroom. No street shoes were allowed. This was to prevent dust or grit from getting in the reactor part

Walker L. Cisler, (left) president, Detroit Edison Co., Power Reactor Development Co., and Atomic Power Development Associates, accepts delivery as Howard Maynard, (right) president, Snyder Corp., explains that experience and special fabricating knowhow undoubtedly will lead Snyder to quote on future reactor jobs

time project engineer to co-ordinate both technical and manufacturing operations. PRDC also had a full time project engineer assigned to the Snyder project. Countless inspections were made during production to make sure that dimensional and protective requirements were being met.

• **Facility Changes**—To meet the extreme requirements for cleanliness, Snyder had to provide special production facilities in its large assembly bay. A cleanroom (36 x 42 ft with a 20 ft ceiling) was built. It and a storage anteroom were framed in with wood, then completely covered with airtight plastic sheeting.

Snyder then put a 5 ton air conditioner and a 10,000 volt electrostatic dust collector in the room, which was held at 70° F, with humidity controlled to a 45 to 55 per cent level.

As another precaution, workers changed into clean shoes before entering the room; they also wore white smocks and hats.

Engineers had to come up with facilities for chemically cleaning all the parts that went into the assembled plug. They built two 12 ft diameter tanks, each 24 in. deep. Each of the tanks was heated to 130° F with electric heater units totaling 120,000 watts in power. Parts were dipped into a cleaning tank, then into a rust inhibitor.

Snyder may be back for more. Commenting on the project, Mr. Maynard says: "From the management viewpoint, this type machining and assembly fits in well with the knowledge and experience of a special machine tool company. I am sure that we would again be pleased to quote on a nuclear energy project of this type."

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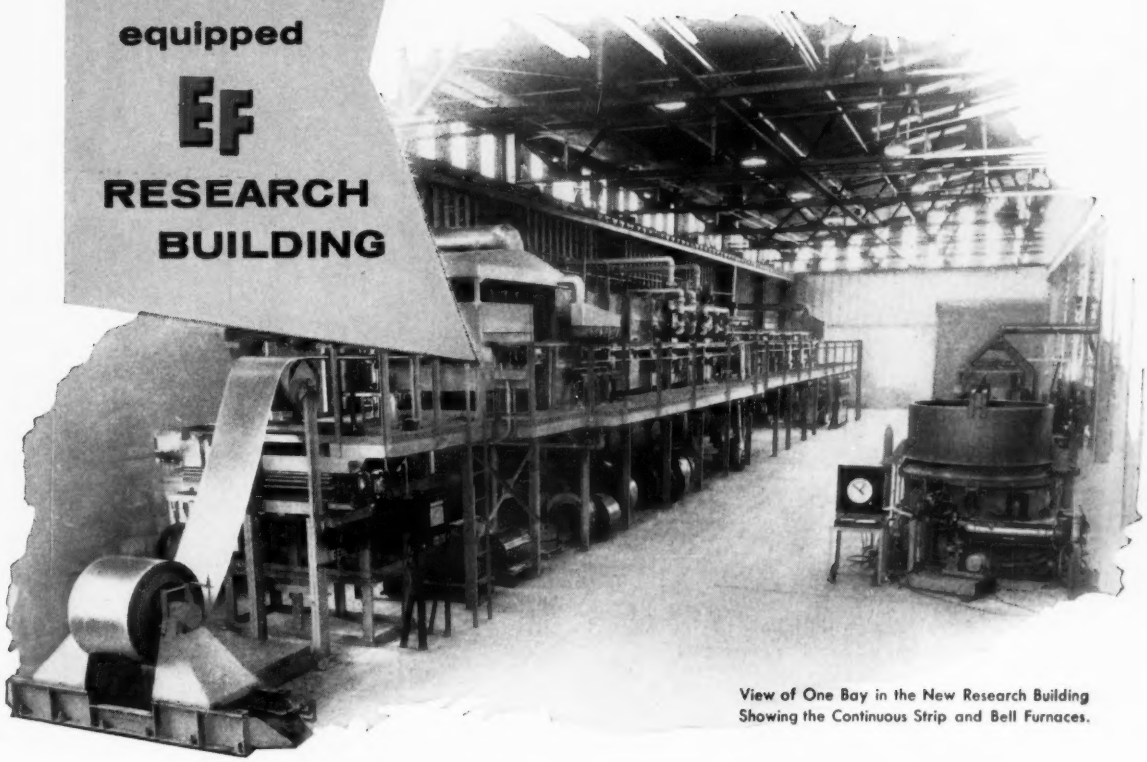
New completely equipped EF RESEARCH BUILDING



View of One Bay in the New Research Building Showing the Continuous Strip and Bell Furnaces.

to develop and test improved heat treating techniques benefitting all metal producers and fabricators . . .

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Now, our facilities are much enlarged. The entirely new building is 80 ft. wide x 180 ft. long. Equipment includes a continuous strip furnace suited for processing at various cycles; bell, wire mesh belt, batch and pusher furnaces, with and without forced circulation; vacuum furnaces for batch or continuous operation; endothermic and exothermic generators; ammonia dissociators; atmosphere refrigerators; adsorption type gas dryers; CO_2 scrubbers, and completely equipped chemical and metallurgical laboratories.

From these new facilities will come improved techniques for treating familiar materials, and new techniques for treating the newer metals of the jet and space age;— also expanded testing of critical materials used in our furnaces, to maintain our unsurpassed standards of quality and performance.

As in the past, our research facilities will be available to metal producers and processors, for development and test work, conducted, if desired, in the presence, and with the assistance of your own technicians and production men.

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System Cleans Electric Furnace Exhaust

It collects contaminated air and passes it through a cloth bag dust collector. Solid and gaseous waste materials are removed. Operation does not interfere with charging or tapping. Capital outlay and operating costs are modest

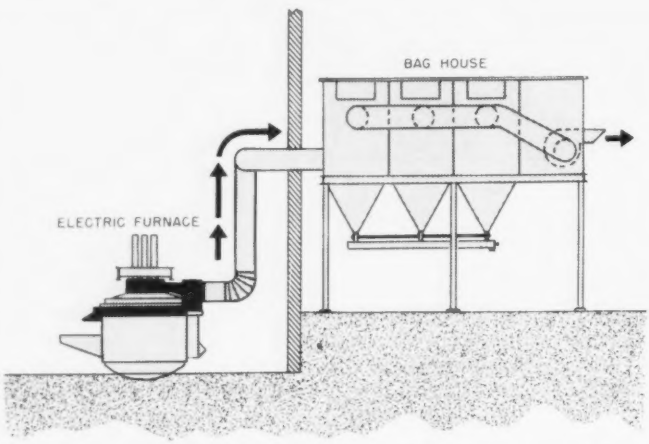
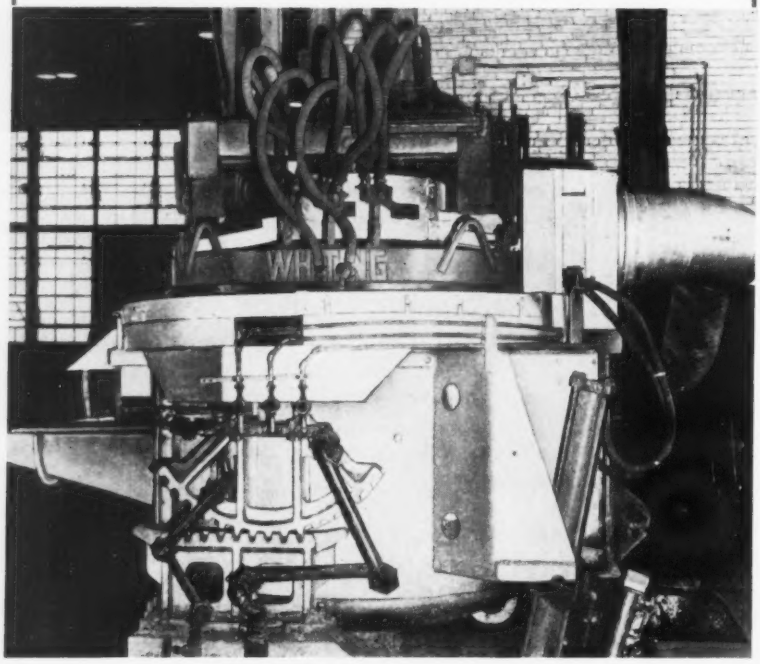


Diagram of a typical plant installation. This exhaust system meets the most rigid pollution control requirements



Fumes from the electrode hood, manifold ring, and slag spout hood enter the exhaust system through the distribution section (upper right)

MANY communities are tightening their pollution control laws. Manufacturers are doing their best to comply; some are even anticipating ordinances by installing above-standard equipment to keep waste materials from leaving the premises by air or water.

Makers of antipollution equipment are concentrating on effective control of contaminants, minimum interference with machines or processes, and low purchase price and operating costs. Example: An exhaust system for electric arc melting furnaces, offering effective and efficient control of dust, fumes, and smoke. It's made by Pangborn Corp., Hagerstown, Md.

• Design is simple. The system doesn't interfere with furnace operation.

A roof manifold ring and baffle, a pouring spout hood, and a distribution section with a slag spout hood are attached to the furnace shell. An electrode hood is mounted on the furnace roof.

Adjustable openings in the manifold ring insure equal air distribution. Dust and fumes from the ring, baffle, and hoods, are carried away through the distribution section.

On top charge furnaces, the electrode hood and connecting duct swing aside with the roof. A spring loaded gate, or damper, closes the opening in the distribution section. That increases air flow through the manifold ring, to collect dust from the charging operation.

• Contaminated air is processed in a cloth bag dust collection system.

The hood is connected to an air cleaning system by a telescoping or flexible swivel connection.

Air is cleaned in a series of cloth bag dust collectors. Bags are made of synthetic fiber to withstand furnace exhaust temperatures.

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Cuts freely with short, brittle chips. Made to close tolerances—and extremely straight.
Meets all Standard Government and A.S.T.M. Specifications.
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Close length tolerances—In multiple spindle operations, you get no wasteful long rod ends. You get smooth operation of automatic bar feeders on single spindles, too.

Close control of chamfer—If collets slip off the rod end, they climb back easily. Rod doesn't jam against the stop, to cause smash-ups and costly down time.

Increased machinability—structural control of the rod assures you of better cutting: smooth, clean finish and short, brittle chips.

But in spite of Chase 3-MARK's premium uniformity and quality, it will be an "off-the-shelf" item in every Chase Warehouse! So ask your Chase Representative about 3-MARK free-cutting brass rod. Insist on it—*the finest free-cutting brass rod you can buy anywhere!* You can reach your Chase Representative locally, or by writing Chase at Waterbury 20, Connecticut.

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High Pressure Unit Used to Test Casing

TOP QUALITY oil well casing is insured by a collapse resistance tester at the Aliquippa, Pa., Works of Jones & Laughlin Steel Corp.

The high pressure unit was supplied by Ritter Engineering Co., Pittsburgh.

• It includes two pressure vessels. A wide range of casing sizes is handled.

One vessel is used for testing tubing 4½ to 6⅝ in. OD, the other for casing 7 to 10¾ in. OD.

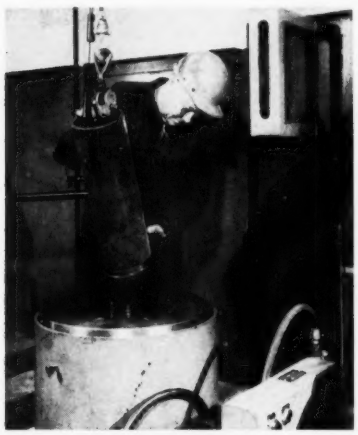
Test samples, cut from production heats, are 14 in. long for smaller diameter casing, 21 in. for the larger.

Because of the high pressures used in the tests, several safety features are built into the equipment. Examples: Tests are done by remote control—outside the equipment enclosure.

Collapse pressures up to 25,000 psi are applied. So customers are assured that casing meets or exceeds published specifications, says E. A. Booth, manager, tubular products.

• Threaded covers and rubber seals prevent pressure losses.

A rubber seal is placed at one end of the sample before it's inserted in the pressure vessel. A second seal is set on the other end, and the vessel cover is threaded into place. Hydraulic oil is forced into the vessel by a pump and an intensifier.



OIL WELL CASING
. . . enters collapse test chamber

Quick Fastening Insulation Cuts Installation Time

It has wire mesh face with projecting wires on one end. You just wrap and hook. Time savings can be as high as 25 per cent. It will withstand temperatures up to 1200° F

QUICK FASTENING pipe insulation cut installation time 25 per cent at the new No. 3 cold strip mill of Inland Steel Co., Chicago. The piping is in the tandem mill basement.

The insulation is a mineral or slag wool, flexible blanket type (No. 101) made by Baldwin-Hill Co., Trenton, N. J. Tie wires are built in.

The material is less expensive than other types, says the insulation contractor, Jaymar-Olmen Co., Melrose Park, Ill.

At Inland Steel, a 2 in. thickness is wrapped around steam traced oil and water lines, coke oven gas lines, and service water lines over 18 in. in diameter. Some piping is as large as 36 in. in diameter.

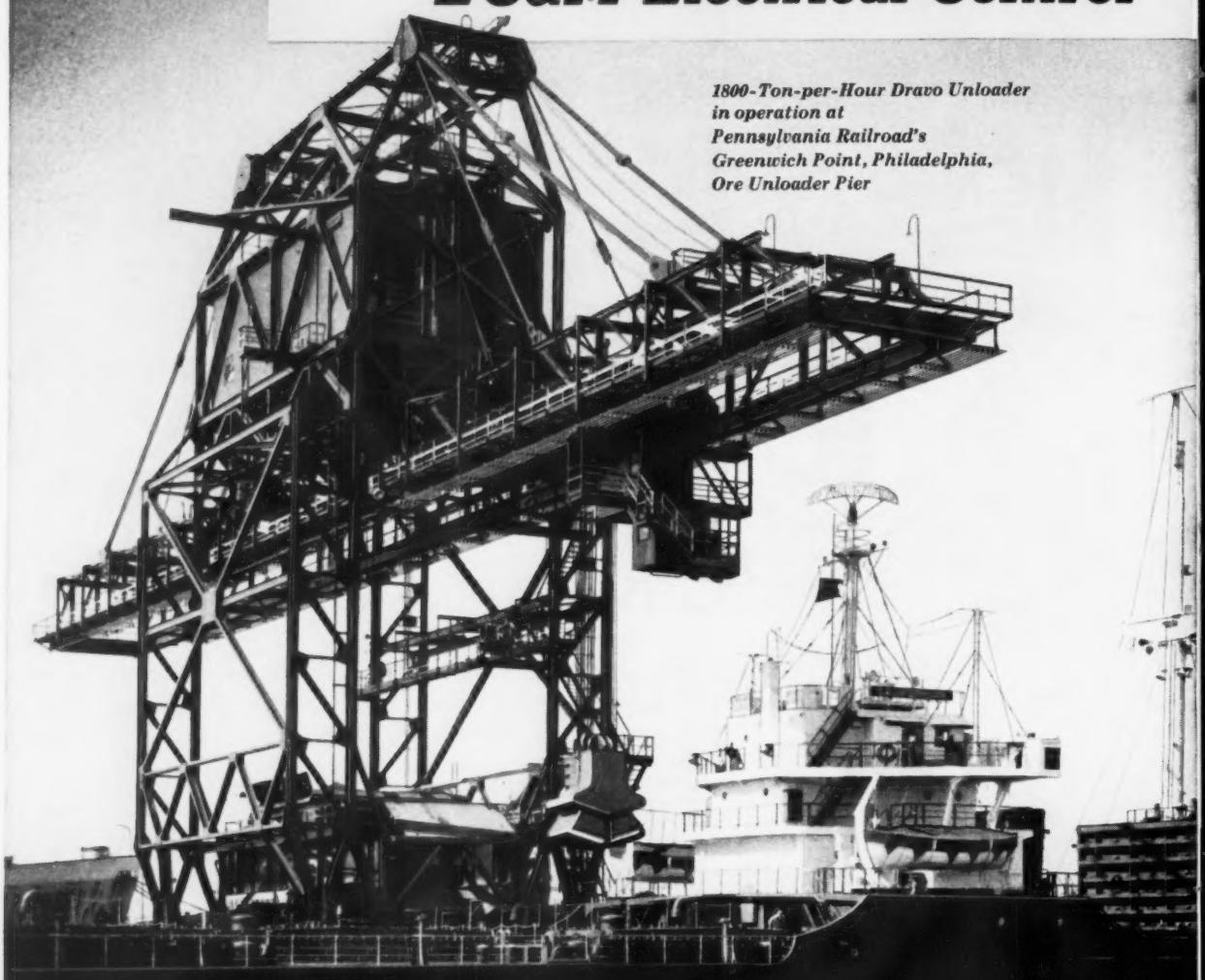
The insulated lines were finished with two layers of a flexible vapor barrier material and paint to provide an attractive appearance.

• **Properties**—It can be fitted snugly, doesn't pick up moisture, and is vermin resistant. The material is suitable for temperatures up to 1200° F. It was selected at Inland Steel because it provides the specified 7 lb per cubic foot minimum density at the exact thickness desired.

The material has a welded metal facing of galvanized wire mesh (16 gage). No other materials are required to fasten the flexible covering around the pipe.

Seven lead wires project from one end of each precut length. When the insulation is wrapped around the pipe, lead wires are hooked under the stay wire on the meeting edge of the blanket. The insulation is pulled tight and the projecting wires are bent up and over the stay wire. The ends are pushed down into the material to prevent them from protruding.

EC&M Electrical Control



1800-Ton-per-Hour Dravo Unloader in operation at Pennsylvania Railroad's Greenwich Point, Philadelphia, Ore Unloader Pier

Square D Field Engineering Service is available through more than one hundred Square D offices, backed by an international network of over 1000 authorized electrical distributors and 17 plants in the United States, Canada, Mexico and England

Executive Offices • 6060 Rivard Street, Detroit 11, Michigan

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

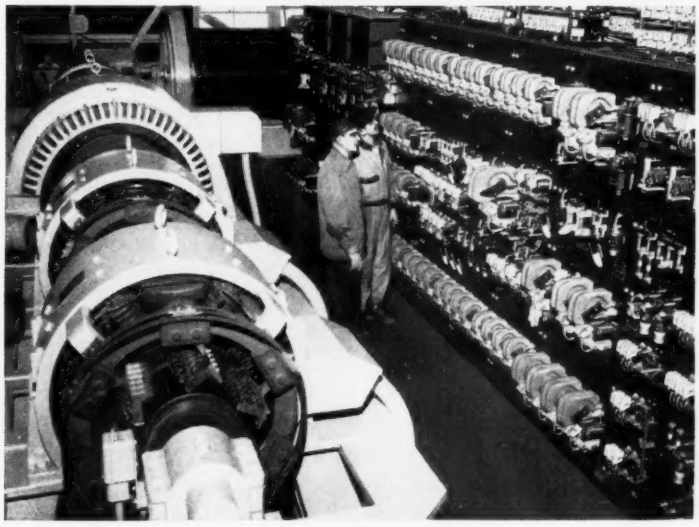
for Industry's Big, Tough Jobs!

22½ TON BITES!

Everything about this ore unloader is big... and it does a big job with amazing speed. Powered through 20 motors ranging in sizes up to 800 HP, it takes 22½ tons of ore from a ship's hold on an average cycle handling time of 45 seconds!

Electrical control equipment does a big job, too, in putting this unloader through its paces. And there's a lot of it. Hoist control, trolley control, bridge control brakes. *All of it is EC&M.*

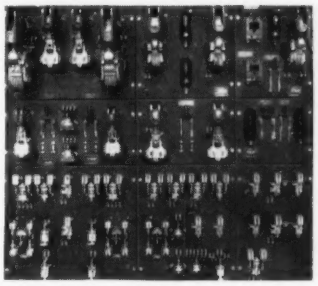
Consult EC&M when planning adjustable voltage installations



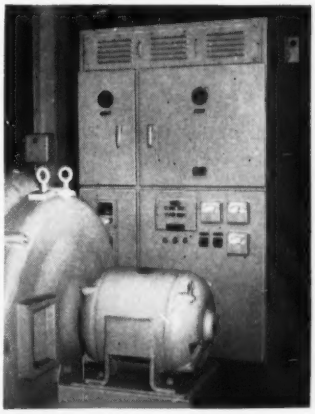
Here is an example of EC&M's control and engineering service in action. These EC&M control panels are mounted in the machinery room, 100 feet above ground level, along with generators which supply DC power for unloader motors. EC&M is geared to supply the complete job including rotating machinery for adjustable voltage and constant potential drives.

Photos courtesy Dravo Corporation, Elliott Company, and the Pennsylvania Railroad

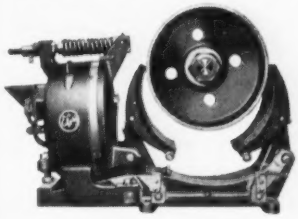
EC&M PERFORMANCE-PROVEN
CRANE EQUIPMENT



EC&M Adjustable Voltage Control Panel (mounted on trolley) for Hold and Close Line Motors and for Trolley Motor, plus Protective Panel for other drives



EC&M Type ZHA 4160 Volt Starter provides pushbutton starting of 800 HP Elliott synchronous motor driving 4 generators



EC&M Type WB Brakes—designed for fast response in releasing and setting. 100% lubrication insures exceptionally long life

Steel Slugs Squeezed . . .

Into Finished Latch Rotors

SCRAP LOSS in the production of steel rotors for automotive door latches has been practically eliminated by the use of the cold extrusion die process at the M&S Mfg. Co., Hudson, Mich.

The rotor looks like a six-tooth sprocket wheel with an integral shaft. It has been produced at least four different ways.

One was to machine the part from a special cold drawn section. That operation is still being used, but it requires considerable machining and a waste of 65 per cent of the section in steel chips.

An extruded shape was also tried but was not ideal because of the integral spindle on the rotor.

• M&S has found the cold extrusion die process to be most economical without loss of part quality.

The 1½ in. diameter rotors are formed from a round slug in two hits of a press. One press produces 50 rotors a minute. The slugs are cut from ¾ in., SAE 1010, cold drawn bar stock supplied by Jones & Laughlin Steel Corp. The steel is aluminum killed to a fine grain structure and annealed to a maximum of 65 Rockwell B.

• Cold extrusion improves the mechanical properties of the 1010 material, says D. A. Lillywhite, M&S vice president.

After the parts are deburred, washed, and broached to produce parallel flats on opposite sides of the spindle, they are surface hardened to a depth of 0.002 to 0.005 in. in a cyanide bath.

The parts are extruded in a 500 ton Verson Press—a double crank, single action type. Extrusion slugs are given a special phosphate coating for lubrication in the dies.

• Two rotors are extruded simultaneously in eight rotating dies.

The slugs, which are cut to about 1⅛ in. long on automatic screw machines, are reduced slightly in length. The metal in the ⅜ in. wide rotor teeth is squeezed out by a reduction in diameter for the integral spindle.

The only loss of material in the operation (a fraction of 1 per cent) is in cutting the blanks, deburring, and cutting flats on the spindle. M&S has a production potential of 1 million rotors a month.

"We've cut stainless costs with ferromanganese-silicon"

Ferromanganese-silicon allows savings of as much as $8 per ton, depending upon practice, in the production of high-manganese stainless steels. It also reduces manganese costs for the chromium-nickel grades of stainless.

The alloy is both an efficient slag reducing agent and the lowest-priced source of low-carbon manganese currently available. For details on cost reductions in your practice, contact your UNION CARBIDE METALS representative.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

Ferromanganese-silicon gives lower costs, rapid solubility, and high manganese recoveries.

UNION CARBIDE METALS

Electromet *Brand Ferroalloys and other Metallurgical Products*

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Bandsaws Speed Testing Of Alloy Steel Plates

As many as 150 specimens are prepared daily at Lukens Steel Co. Two machines remove excess metal from flame cut sample blocks, leaving only 1/32 in. of stock to be taken off by milling

By E. A. BERRY
Superintendent
Machine & Forge Dept.
Lukens Steel Co.
Coatesville, Pa.

NEED test samples in a hurry?

Band machines, using high speed steel saw bands, have reduced the time required to make Izod test specimens by about 50 per cent at Lukens Steel Co., Coatesville, Pa. The two machines, supplied by the DoAll Co., Des Plaines, Ill., have replaced six miscellaneous saws.

• Test blocks are flame cut from plates 9/16 to 6 in. thick. To minimize error, three specimens are cut from each block. Up to 150 specimens must be produced in an 8 hour shift.

The area of the flame cut block from which a sample is to be taken is laid out and stamped with an identification number.

Samples must be taken from the interior of the block, which isn't affected by flame cutting. They must be properly oriented with the grain structure that is produced by rolling.

Sometimes, as much as 80 per cent of the flame cut block must be removed. Milling away the unwanted material would be a costly job.

Unwanted metal is removed from test specimens with a precision bandsaw. Several cuts are required to make samples from plates over ¾ in. thick

• Accuracy of the band machines permits blocks to be sawed close to their finished size. That leaves less stock to be removed by milling.

Bandsawing separates metal by reducing only a narrow path to chips.

Most of the unwanted stock is removed quickly; only enough is left for precision machining of the specimens.

Samples made from plates up to ¾ in. thick are cut by friction bandsawing, with band speeds up to 12,000 fpm. Friction sawing is the fastest process, wherever it can be employed.

Heavier pieces are cut by conventional precision bandsawing. The operator determines the series of cuts that will separate specimens from unwanted metal with the least cutting.

In most cases, the test block is cut into pieces 9/16 in. thick, then sawed into 9/16 in. squares.

Pieces are then band machined to within 1/32 in. of milled size; they require only one pass in the milling machine.

• Machines are built for hard, continuous use. Choice of saw bands is important.

They're similar to conventional band machines, but modified for heavy duty service. They have 15 hp drive motors and transmissions designed for dependable performance.

Band tools are selected carefully to insure accuracy and long life; samples from steel plates as hard as 320 Bhn require high speed steel saw bands.

Two Parts Are Sometimes Better Than One

Want design simplification and a production boost? Don't overlook the possibility of using more parts where a one piece assembly is giving trouble. The approach eased design problems involving an ink carrying tube for a pen system of an electric recorder made by Hays Corp., Michigan City, Ind.

• **First Try** — The company attempted to swage stainless steel needle tubing over wire to make a nib while the rest of the bore was left large enough for free ink flow.

Trouble began immediately. Hays found that the tubing couldn't be swaged in the full hard temper without cracking.

More difficulties: The tubing couldn't be supplied annealed before swaging because the austenitic stainless steel (Type 304) cannot be precipitation hardened. For that reason, the necessary stiffness could not be imparted after swaging. Hardenable grades couldn't be used because they weren't resistant enough to ink corrosion.

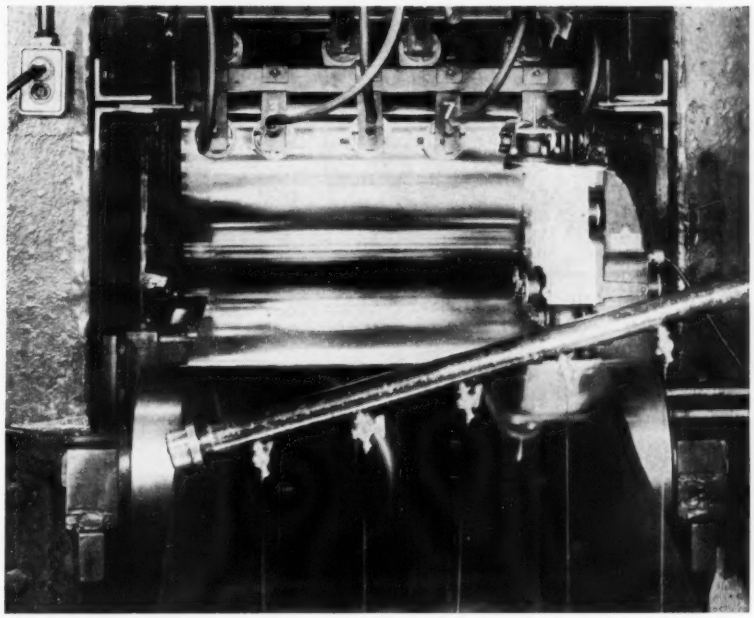
After swaging, Hays also had difficulty removing the wire from the tube. The wire was cut off at the nib end and the resulting slight expansion made it hard to remove. The cut end of the wire tended to put a slight burr on the tube end, which could scratch charts.

Another problem: How to polish the nib end. The outside of the point could be polished in a cone, but a satisfactory method of polishing the 0.007 in. bore wasn't found.

• **The Answer**—A smaller pen nib is soldered on the tube end. The inside diameter is slightly larger than the swaged bore on the one piece tube but small enough for correct flow. The inside diameter of the tube to which the nib is soldered is about the same as the unswaged part of the one piece tube.

The $\frac{1}{4}$ in. piece for the pen nib solved the point polishing problem. It made liquid honing of both the inside diameter and the outside diameter feasible.

The material is standard 19 gage needle tubing from Superior Tube Co., Norristown, Pa.



Radiant Gas Burners Insure Uniform Strip Thickness

They expand low spots on the mill roll to keep strip within 0.0002 in. of nominal gage. No soot is left on the steel because flames don't touch the roll

STEEL users are placing greater emphasis on uniform gage, from one side of a strip to the other. Steelmen are constantly looking for tools and techniques that will help them meet closer tolerances.

Radiant gas burners, spaced across the top roll of a cold finishing mill, heat and expand the roll to insure uniform strip thickness at Alan Wood Steel Co., Conshohocken, Pa. Burners and the combustion controller used with them are supplied by Selas Corp. of America, Dresher, Pa.

• **Quick response of the burners permits closer control of strip thickness.**

Controlled rate of heat transfer and the short distance from the roll to the burners keep heating time to a minimum.

Nine of the units are spaced across the top roll, 3 to 4 in. from the face. Steel strip is checked carefully as it passes through the mill. When uneven gage is detected, the burners are ignited where necessary to expand low spots on the roll.

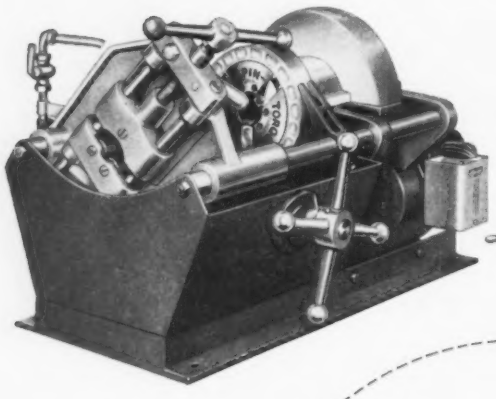
Strip is held to within 0.0002 in. of nominal thickness, and wrinkling is prevented.

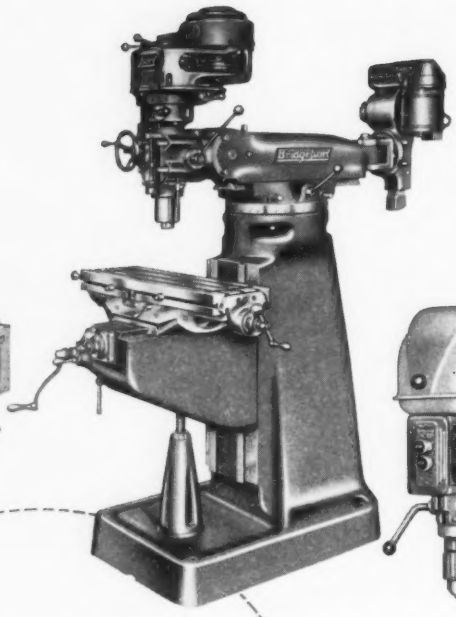
• **Combustion is confined to a refractory cup; flames don't touch the roll.**

The combustion controller feeds a mixture of gas and air to the burner tip. The mixture is distributed radially, burning against a cup shaped refractory surface.

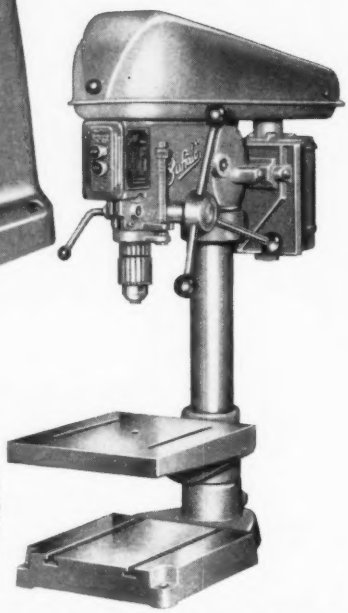
Burner surfaces, made of ceramic, become incandescent and throw radiant heat toward the mill roll. Absence of flame impingement on the roll prevents soot from being deposited on the strip.

The Toledo Pipe Threading Machine Company's compact No. 999 pipe and bolt machine features instant change from cutting to threading, quick-change die heads. Cutler-Hammer Motor Control is supplied as original equipment.





Bridgeport Machines Inc. provides Cutler-Hammer Three-Star Motor Control as standard original equipment on their highly versatile Turret Milling Machines, which will mill, drill and bore, and, with attachments, will cherry, trace, and right angle mill.

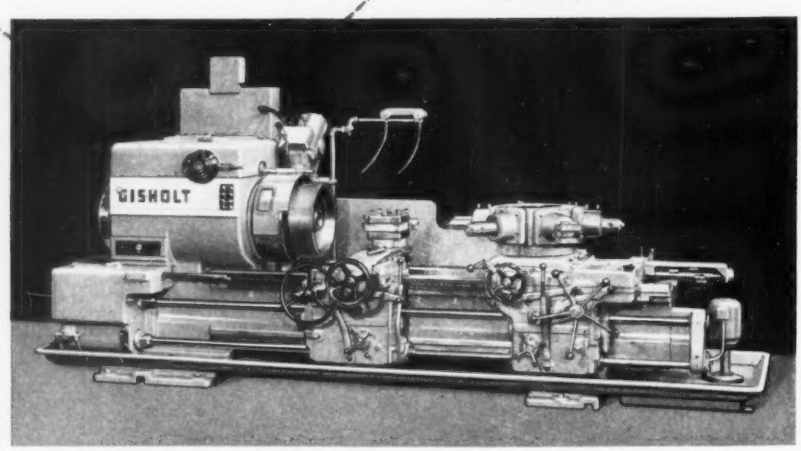


The Buffalo Forge Company's #15 Drill combines sensitivity for small hole drilling and rigidity for high volume production. Cutler-Hammer Motor Control is installed as original equipment.

CUTLER·HAMMER
CONTROL
C·H

Choice of the leaders ... the mark of better machines

A fine machine performs at its best when Cutler-Hammer Control directs and protects it. Cutler-Hammer Control installs easier, works better, lasts longer. For prompt attention to your control requirements write Dept. P213, Cutler-Hammer Inc., Milwaukee 1, Wisconsin.



The Gisholt Machine Company's MASTERLINE 4L Saddle Type High Production Turret Lathe shown above is equipped with Cutler-Hammer Control. Precise motor control simplifies machining of 21" vee-belt sheaves in two operations.

CUTLER·HAMMER

Cutler-Hammer Inc., Milwaukee, Wis. • *Division:* **Airborne Instruments Laboratory.** • *Subsidiary:* **Cutler-Hammer International, C. A.**
Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation.

Welding Heads, Controls Combine to Suit the Job

VARIOUS combinations of two Aircomatic welding heads (Models AMH-D and AMH-E), two controls (Models AMC-C and AMC-D), and two machine barrels (Models AM80-A and AM80-B) can be used to suit the needs of individual jobs.

The welding heads for the gas shielded, metal arc process are single motor driven units primarily intended for use with CAV and RAV power sources using ferrous and nonferrous wires, 0.030 to 1/8 in. They can also be used with conventional direct current power sources when ferrous wires only are used. The heads can be used with argon, helium, mixtures of both, or carbon dioxide as a shielding gas.

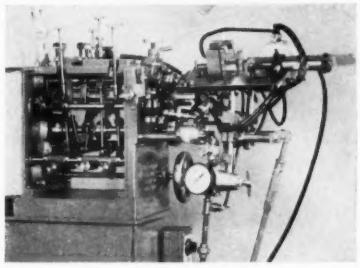
Model AMC-C control is a standard unit complete with crater filler, meters, pushbuttons, gas, and water solenoids. The Model AMC-D is designed to be used by fixture builders who are considering a common control panel for all electrical equipment.

Both machine barrels are rated at 800 amperes dc continuous duty cycle. Model AM80-A is a water cooled unit with concentric shielding. Model AM80-B is an air cooled unit with an external shield for high production carbon dioxide applications using hard wire only.

For more information, *write* Air Reduction Sales Co., a division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y.

Looping Attachment for Coil Springs Automatic

LOOPS can be made on the end of coil springs with an attachment introduced by Sleeper & Hartley for its No. 0 universal spring coiler.



The unit has been tested through a range of 0.010 to 0.020 in. wire. The tests have included successful looping of springs from 1/8 to 3/16 in. OD. It is expected that further tests will extend both ranges. Normal production is about 50 springs a minute.

The lengths of springs which the attachment will handle are limited only by the wire feed capacity of the machine. It is also capable of handling springs with as few as three or four coils.

The transfer mechanism of the unit has a small claw which spreads one coil from the body of the spring so that when the spring is carried back into position for last end looping, the tools are sure to enter properly without the necessity of extreme precision.

For more information, *write* Sleeper & Hartley Inc., 335 Chandler St., Worcester 1, Mass.

Plating Rinse Additive

DRAINAGE of plating parts is promoted and the number of plating rejects reduced by H-VW-M Rinsoff, a new rinse aid addition agent.

Small concentrations added to the hot water rinse will reduce surface tension. Water rinses off faster and water stains are minimized.

The additive is a balanced combination of organic active agents and solvents. Only 2 fluid ounces are required per 100 gallons of hot rinse water under normal operating conditions.

For more information, *write* Hanson-Van Winkle-Munning Co., Church Street, Matawan, N. J.

Vibration Analysis Unit Cuts Maintenance Costs

A PORTABLE balancer that can analyze vibration in all types of assembled machinery makes it possible to lower maintenance costs and increase quality of production.

The unit is suitable for eliminating vibration in grinding wheels and cutter heads. It quickly detects vibration caused by worn bearings, belts, and misalignment. It can be used on equipment such as blowers, fans, pumps, turbines, rolls, motors, engines, driveshafts, and many other machines.

In operation, the amplitude of vibrations of the part under test is electromagnetically converted into

electrical impulses by the vibration pickup unit. The impulses are then amplified in the electronic unit which triggers a strobe light to freeze the image of the rotating part, pinpointing the trouble source. The angle of unbalance is indicated through the stroboscope and the amount of vibration appears on an easy-to-read meter.

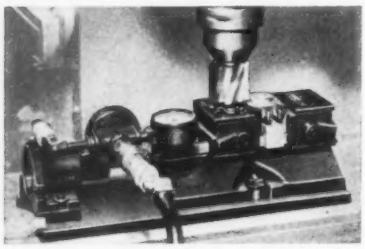
For more information, *write* Stewart-Warner Corp., 1825 Diversey Parkway, Chicago 14, Ill.

Fixture Holds Odd Shapes In High Speed Operations

IRREGULARLY shaped parts can be milled, planed, drilled, turned, or ground at production speeds when held in the Bliss contour grip holding fixture.

The holding device molds its grip to any shape, and can be actuated hydraulically, pneumatically, or through solenoid valves. It also can be synchronized with the operation of any machine tool.

The gripping jaws of the fixture are composed of movable fingers which adjust to the shape of the part. When the jaws back off from the workpiece, the fingers remain in the same relative position as they were when gripping the piece, making it simple and quick to drop the next piece into position and tighten up on it. If a part of a different shape is to be used, the operator presses levers which move the fingers back to parallel position. When brought forward again, they will form the matrix around the new piece.



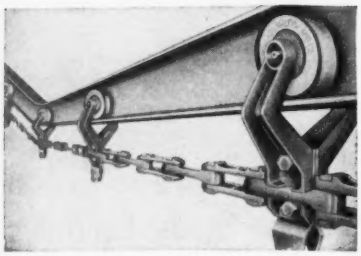
For more information, *write* Die Supply Div., E. W. Bliss Co., 1400 Brookpark Rd., Cleveland, Ohio.

Overhead Chain Conveyor Is Extremely Flexible

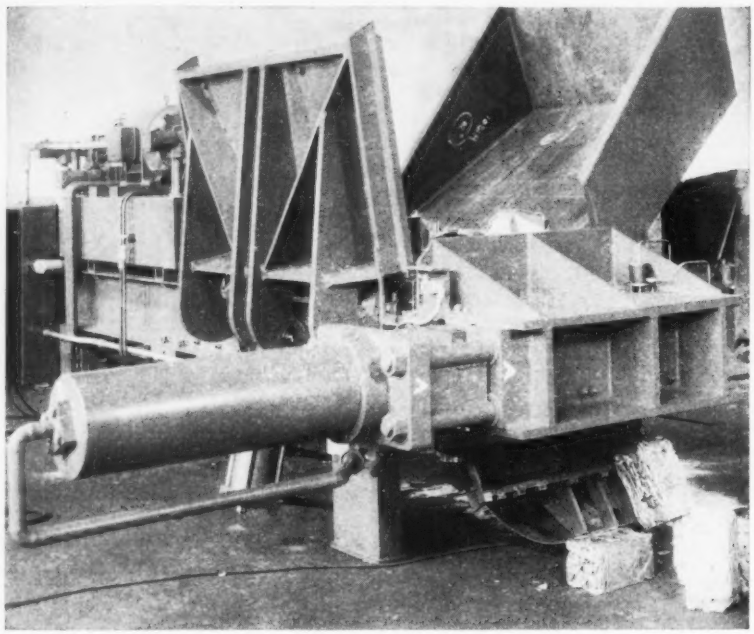
YOU CAN convey products of all types and sizes up, down, out, or around with the R-W #458 overhead chain conveyor system.

The conveyor is equally adaptable to level or multiplane systems. It is easy to install, and may be added to present systems of similar design. It also is easily knocked down for expansion or relocation.

The system consists of a Keystone rivetless type endless chain supported by load carrying trolleys which roll on the lower flanges of a 4 in. I-beam type track. The chain is mechanically propelled and is supported at all horizontal turns by a series of rollers or wheels. The track absorbs the thrust or vertical bends.



For more information, *write* Richards-Wilcox Mfg. Co., Third Street, Aurora, Ill.



Scrap Press Prepares Remelt Stock

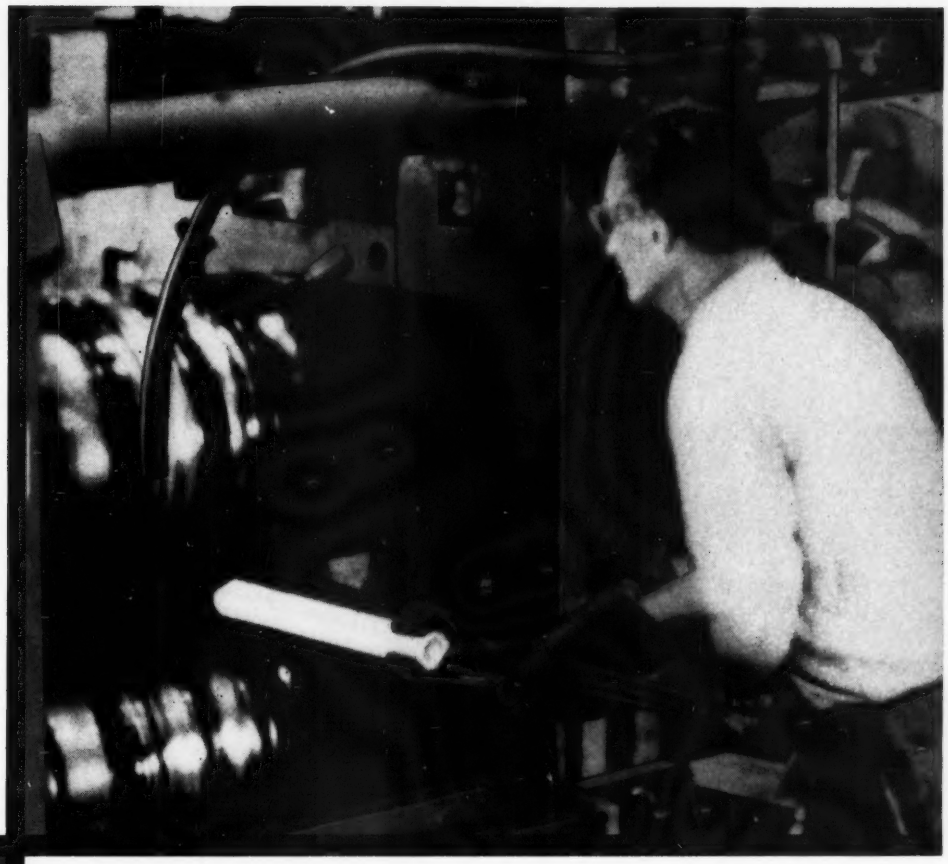
SUCH materials as copper, brass, aluminum, stainless and black steel scrap, wire, coils, containers, or utensils, can be compacted into high density bricks or bales ready for remelting in the Logemann Model 400-PF scrap press.

Features include top loading by means of a filling hopper which can be charged at floor level; a tamper cover to crush bulky scrap into the press box; a charging plate arrangement that permits the hopper to dump a load of scrap into the press while a bale is being made, speeding production; and the positive discharge of the bale from the bottom.

Bottom discharge insures cleaning of the box with each bale, avoiding contamination of bales by foreign matter that might otherwise remain in the press box.

Hourly output is determined by speed of loading. Three charges can be in process simultaneously—one in the filling hopper, another on the charging plate, a third under compression.

The press box is 72 in. long, 36



where something ***special*** *is required...*

BIRDSBORO *rolls and rolling mill machinery*

• Whether it's intricate experimental rolling, the taming of hard-to-work steels, or rough, tough, high production duty . . . Birdsboro's specialized mill machinery, or the complete family of rolls, has something specific to offer. You can measure the difference in your own plant: Increased mill production, less metal removal per roll dressing. A talk with your Birdsboro man can fill in other important details. *Sales Department, Engineering Department and Plant*: Birdsboro, Pa., *District Office*: Pittsburgh, Pa.

MM 25-58

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

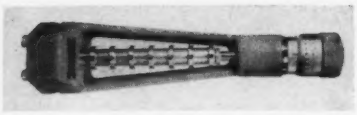
in. wide, and 12 in. deep. The loading area is 60 by 36 in. Bales are 12 in. high, widths can be optionally 7, 6, 5, or 4 in. The length varies depending on the kind and quantity of scrap charged.

For more information, *write* Logemann Bros. Co., Milwaukee 45, Wis.

Unit Gages Height Quickly

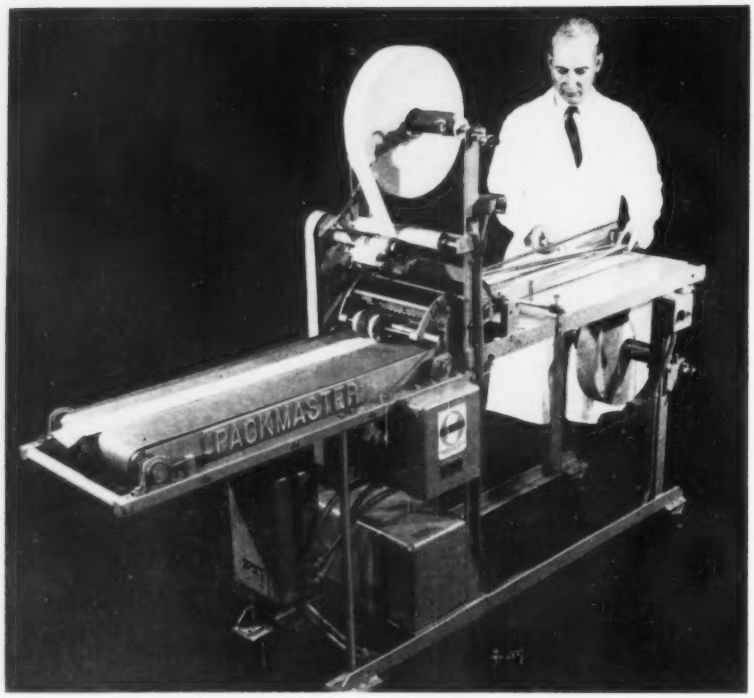
ASSEMBLING of gage blocks is unnecessary if you have a HYT gage. Used in combination with a transfer gage, you can inspect drill jigs, lathe fixtures, gears, cams, splines, profiles, and contours in a few seconds.

The gage enables the operator to set dimensions accurate to



0.000050 in. A patented spring loaded, nonrotating spindle eliminates all chance of backlash. The gage comes in a standard 10 in. model with these accessories: 3 and 6 in. riser blocks, 18 in. transfer gage.

For more information, *write* Van Keuren Co., Watertown, Mass.



Machine Packages Long, Irregular Parts

PRODUCTS such as chrome-molding strips for autos, extrusions, shower curtain rods, and crooked pieces with considerable curvature can be packaged on Packmaster Model 56.

Parts are placed between soft sponge rubber rollers and fed automatically through the wrapping, cutoff, and marking stations. The finish wrapped part is then ejected into a shipping container or onto an exit belt.

The machine's rollers squeeze the cohesive paper strips together around the part being packaged to form a tight, dustproof, conforming wrapping. The method insures protection against abrasion and damage because parts are individually wrapped and sealed against movement within the wrap.

Feed is adjustable from 0 to 120 fpm by a variable speed drive. A printing attachment can be provided to imprint the package with as many as nine lines, 3 in. long, and with a repeat every 7 in.

For more information, *write* Sundstrand-American Broach Div. Sundstrand Corp., Ann Arbor, Mich.

Copper Plate Stencil Mark Can Be Made in 5 Seconds

COPPER marks which afford a bright contrasting appearance against a variety of phosphate coatings can be electrolytically deposited on ferrous metals in 3 to 5 seconds with Lectroetch power units.

The process is useful for putting trademarks or other identifying legends on such ferrous materials as bearings, saws, drills, hand tools, special jigs, and instruments. It may be used on plated surfaces where the surface finish must not be broken. The plated mark also protects the surface against corrosion.

Although the stencil marking is actually copper plating, the manufacturer has developed a harmless organic coating solution to replace the toxic cyanide solution used with commercial plating processes.

For more information, *write* Lectroetch Co., 14925 Elderwood Ave., East Cleveland 12, Ohio.

Centrifugal Pump Design Saves Weight and Space

SUBSTANTIAL cost reductions through conservation of weight and space are possible with the Corcoran centrifugal pump. Construction: Two metal stampings are bolted together to form a housing which encloses a welded impeller assembly.

The unusually smooth interior surfaces give the pump high efficiency flow characteristics. With the same basic pump casing, a range of capacities becomes practical merely by varying the impeller design and the motor size.

Practically any corrosion resist-

Memo to a Man of "Parts"

The number of different parts made from Roebling High Carbon Specialties, Flat Wire and Spring Steel are close to countless.

Some things you can count on, though, are the consistent dimensional and mechanical uniformity you get with any Roebling High Carbon Specialty. They are the qualities that contribute to speeding *your* production and cutting *your* costs.

They are high qualities that make for high values. Next time you need flat wire or spring steel, specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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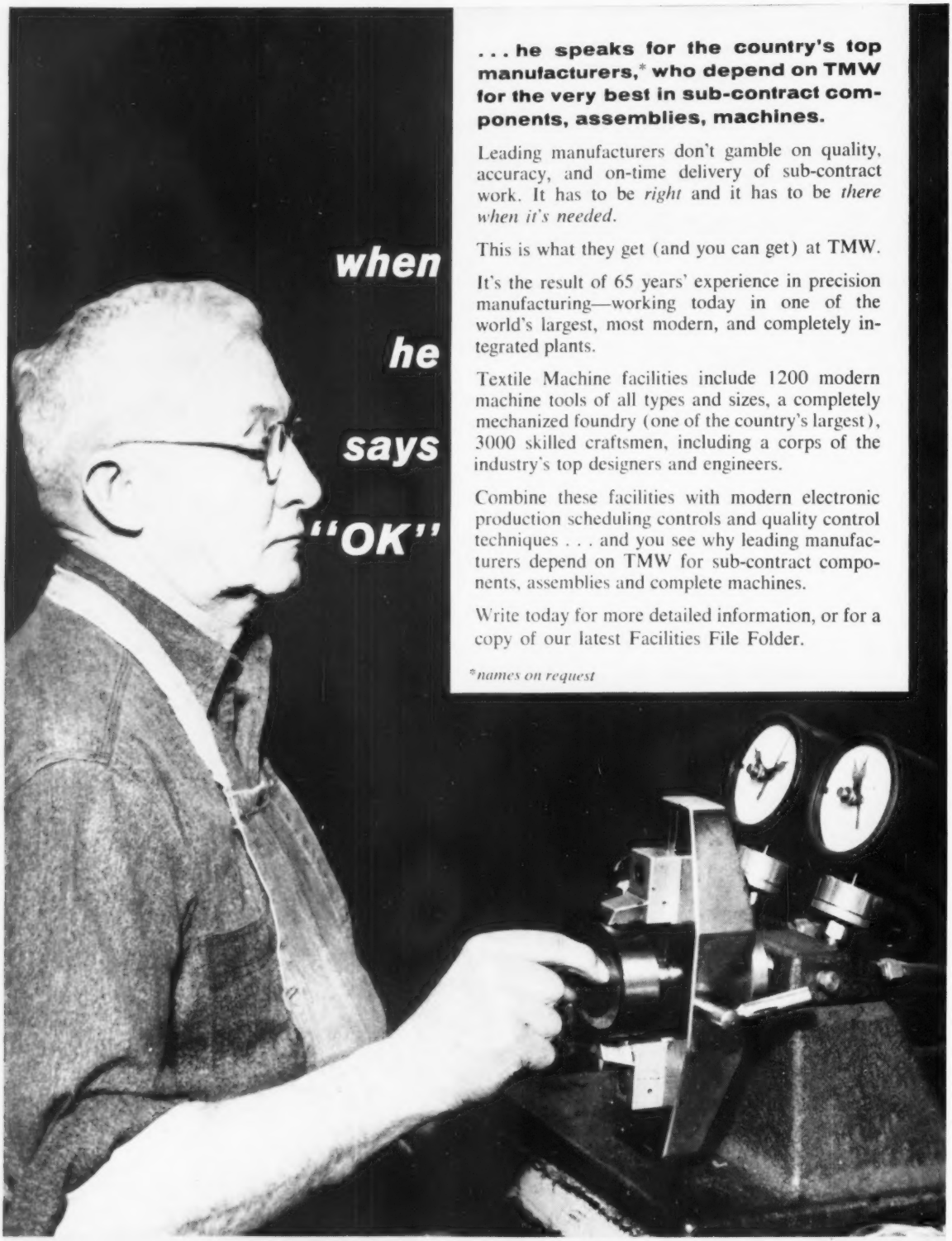


. . . he speaks for the country's top manufacturers,* who depend on TMW for the very best in sub-contract components, assemblies, machines.

Leading manufacturers don't gamble on quality, accuracy, and on-time delivery of sub-contract work. It has to be *right* and it has to be *there when it's needed.*

This is what they get (and you can get) at TMW.

It's the result of 65 years' experience in precision manufacturing—working today in one of the world's largest, most modern, and completely integrated plants.

Textile Machine facilities include 1200 modern machine tools of all types and sizes, a completely mechanized foundry (one of the country's largest), 3000 skilled craftsmen, including a corps of the industry's top designers and engineers.

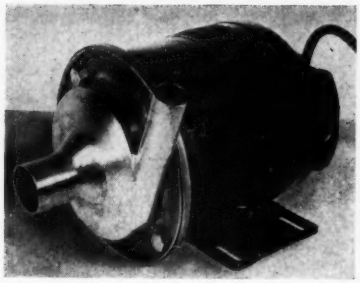
Combine these facilities with modern electronic production scheduling controls and quality control techniques . . . and you see why leading manufacturers depend on TMW for sub-contract components, assemblies and complete machines.

Write today for more detailed information, or for a copy of our latest Facilities File Folder.

**names on request*

TEXTILE MACHINE WORKS

Contract Division • Reading, Pennsylvania



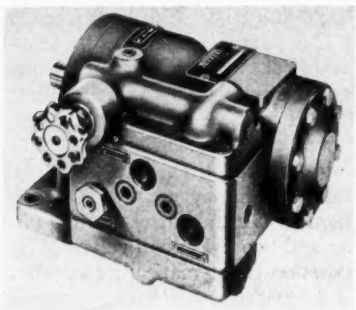
ance requirements can be met, since the parts are all fabricated from standard alloy sheets. Brass, Monel, and various stainless steels are used, but there is no reason why metals such as titanium, tantalum, and zirconium cannot be considered also. Important in many applications is the fact that the entire pump assembly is resistant to corrosion, not just the wetted parts.

For more information, *write* R. S. Corcoran Co., P. O. Box 1404, Mound at Brandon, Joliet, Ill.

Two-Volume Pump Has Single Pressure Setting

YOU CAN avoid generation of heat and waste of horsepower if you install a Vickers two-volume pump. It automatically maintains system pressure with a small volume pump while a fixed differential between the relief valve setting and the unloading allows return of the large volume pump capacity to the reservoir at negligible pressure.

Unloading response of the single adjustment combination pump is three times faster than the previous two-adjustment models. Pressure recovery is exceptional and should improve the hydraulic circuit of many machine designs, particularly



URICK'S URITE GRAY IRON

Wt. 190 lbs.

Courtesy Euclid Division General Motors, Cleveland

GEARED TO THE JOB

URICK Foundry's integrated sales and engineering departments are geared directly to the production department —all working together to supply high quality gray iron castings with dimensional stability, uniform density, and high machinability.

From the planning stage, all the way to the finished part, URITE gray iron castings are designed and engineered to deliver greater tensile strength in relation to the service required, and in many cases with less weight. URITE gray iron is better because it is cast with fine flake graphite uniformly distributed throughout the iron matrix.

URICK'S modern facilities, manned by a competent co-operative team, produces quantities of high grade castings to meet the most demanding schedules.

Contact URICK, the foundry that starts with "U" and stays with you. Write for advanced technical data about URITE gray iron castings.

URITE CASTINGS URICK FOUNDRY

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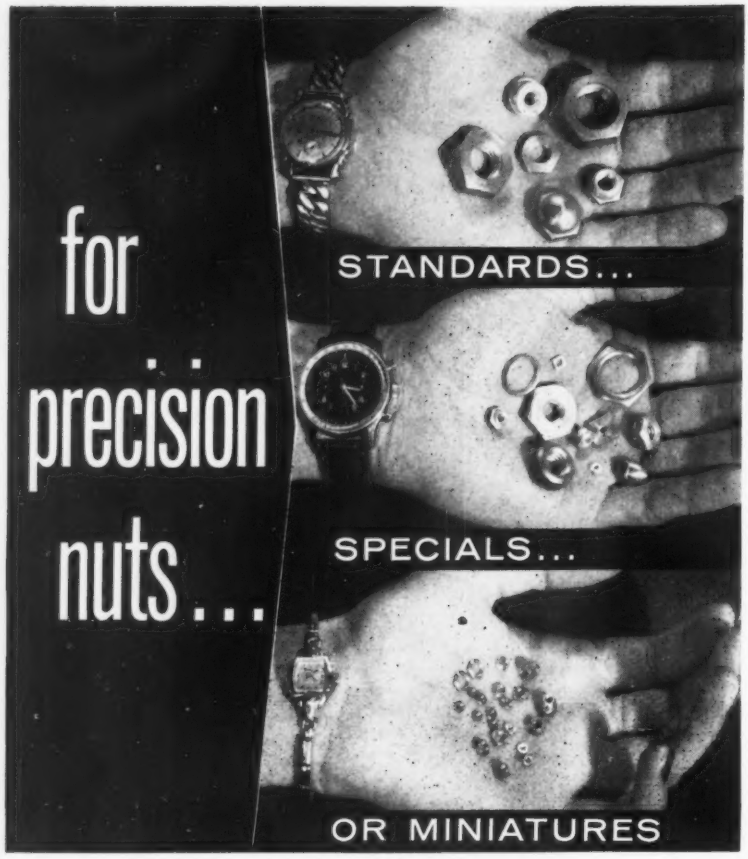

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As the leading producer of precision *turned* nuts, Fischer can meet or exceed every requirement for quality, delivery and price. Fischer's high-speed automatic machines generate extremely accurate nuts with mass-production savings. To assure dependable "on schedule" deliveries, Fischer uses an I.B.M. system to co-ordinate all orders, production scheduling, inventory stocks and shipping dates.

That's why you always get better service . . . faster . . . from Fischer.

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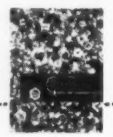

Please send your 20-page CATALOG FS-1000 on brass and aluminum nuts.

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8288-FS

NEW PRODUCTS and equipment

those requiring long runs of tubing or flexible fluid conduit.

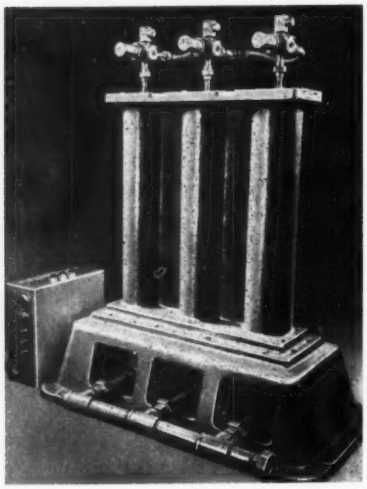
Pumps incorporating this new feature are recommended for 1000 psi at 1200 rpm in the small volume operation, and up to 750 psi at 1200 rpm in the larger volume operation.

For more information, *write* Vickers Inc., a division of Sperry Rand Corp., Detroit 32, Mich.

Free-Piston Unit Pumps Anything that Flows

YOU CAN pump molten metals, slurries, acids, semisolids, and anything that flows in the Crossley free-piston pump.

The unit impels a continuous air-free flow without pulsating or surging. It requires no safety or relief valves; when a stoppage occurs, the pump stops. It can be operated with complete safety and efficiency submerged, or under any condition. There are no motors or engines, driveshafts, packings, seals, oils, or greases.



The pump is operated by compressed air which is introduced into each cylinder in sequence. While the left cylinder is discharging, the center cylinder has filled and is waiting, and the right is filling. Chambers fill by gravity. In each chamber is a nylon free-floating piston and two nylon ball valves. The operation is automatically controlled by a separate control box. Because

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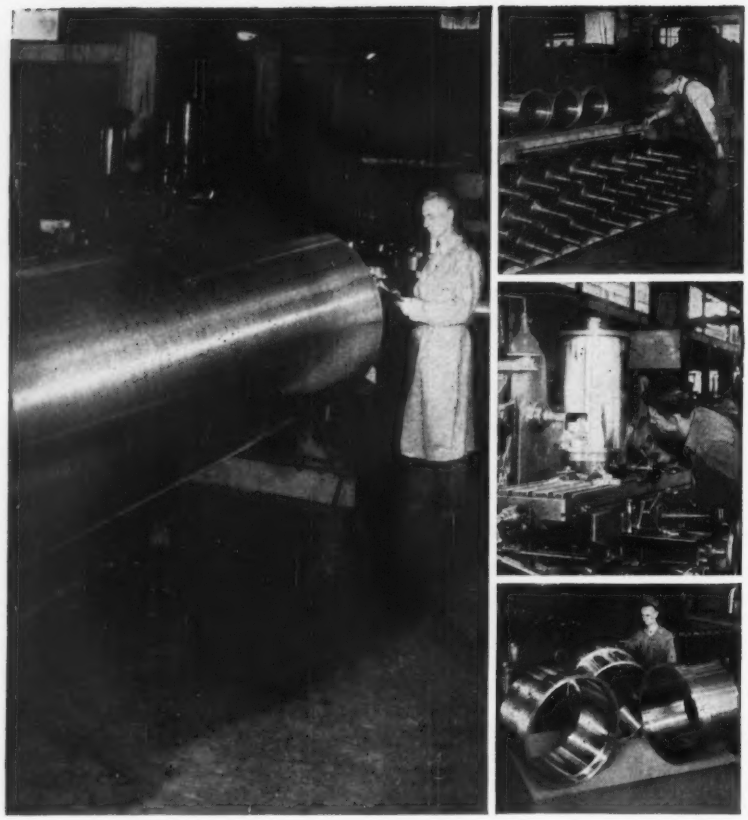

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WHATEVER the inside or outside pressures, Shenango centrifugal castings are better able to withstand them without failure.

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For informative bulletins on the answers to your tough problems, it will pay you to write now to: *Centrifugally Cast Products Division,* The Shenango Furnace Company, Dover, O.

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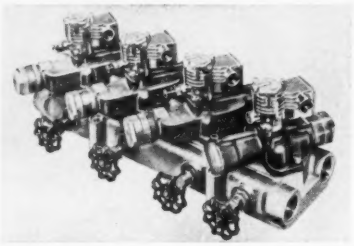
one chamber can be stopped while the other two continue to function, the pump can operate indefinitely without being shut down.

For more information, *write* Crossley Machine Co., Trenton, N. J.

Manifold Reduces Piping

HERE is a four station manifold for control of work cylinders and clutch or brakes on high speed presses and similar machines.

Manifold mounting of valves can simplify piping, reducing original installation material and labor costs. Manifolding of valves also cuts in-service maintenance expense and machine downtime.



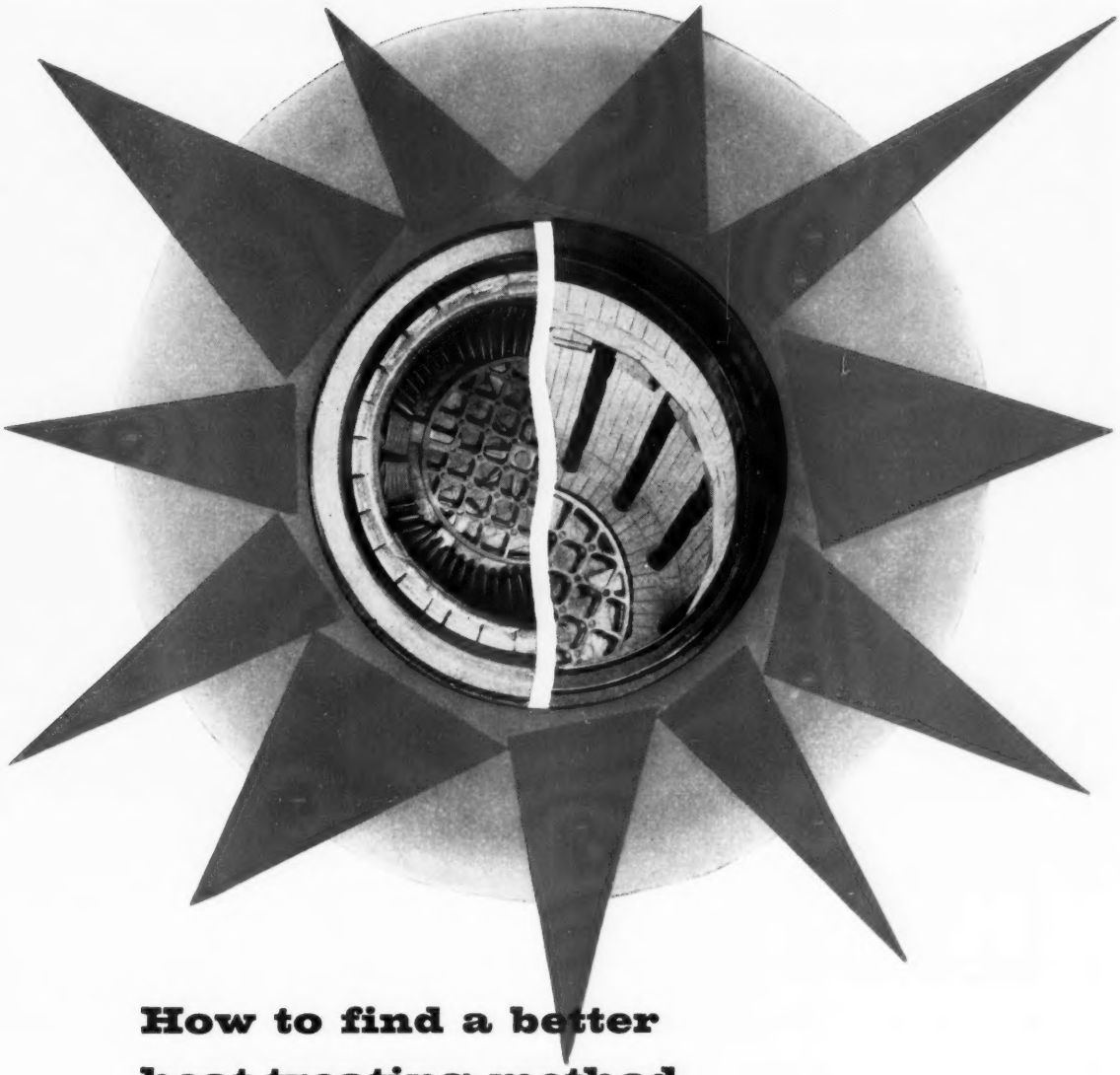
Manual shutoff valves permit servicing of the control valves without shutting off main air supply to the manifold. Built-in junction boxes on solenoid pilots reduce complexity of machine wiring, further cutting installation and maintenance costs, plus improving machine appearance.

For more information, *write* Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.

Table Makes 75 Indexes A Minute, Holds 100 lb

MOST of the features found on larger models have been built into a heavy duty, 7 in. index table which will make up to 75 indexes a minute and handle a maximum workload of 100 lb. Maximum power stroke is three times line pressure. Standard tables have 4, 6, 7, or 12 stations, but any number up to 24 is possible.

To prevent overriding, the indexing cylinder is controlled on the forward stroke by a positive, nonad-



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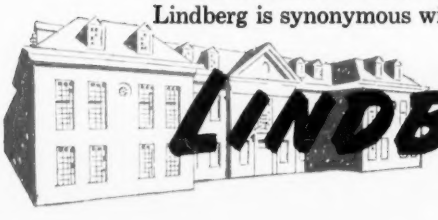

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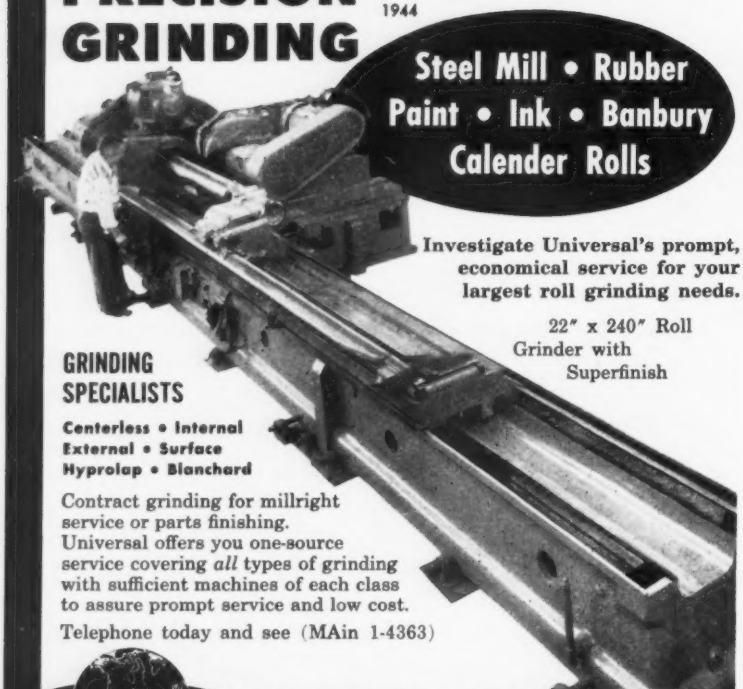

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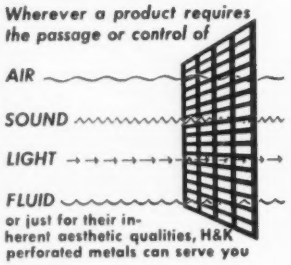

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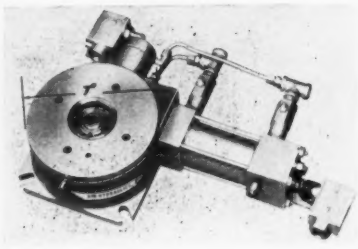


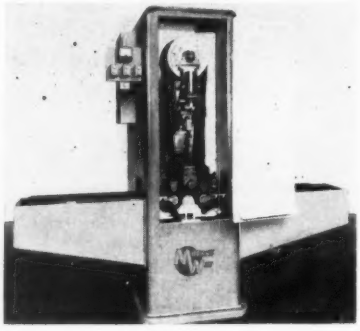
justable stop rod with an adjustable stop on the return stroke. The indexing cylinder is equipped with adjustable air cushion and an adjustable speed control for versatility.

To accurately (±0.0015 in.) lock the table in position, an additional air cylinder is mounted directly on the table's center line. Equipment used with the table is prevented from moving, until the table is locked in position, by a limit switch mounted on the locking cylinder.

For more information, *write* Air Hydraulics Inc., 674 Hupp Ave., Jackson, Mich.

Abrasive Belt Machine Grinds, Polishes, Deburrs

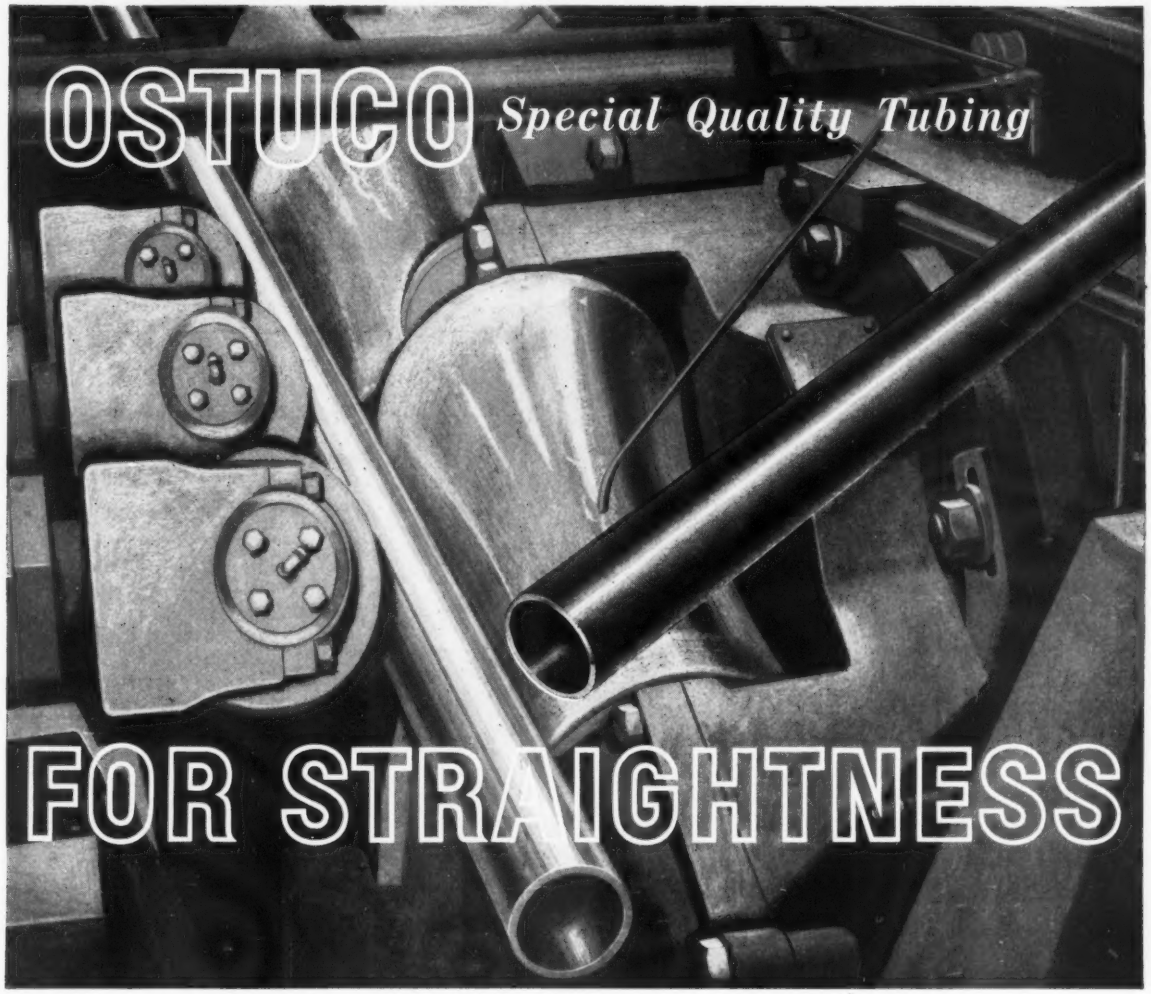
FLAT material with cross sections up to 4 x 12 in. can be ground, polished, and deburred in the Junior Flat Polisher. It will handle coils, sheets, bars, blanks, and manufactured or cast parts, using an abrasive belt for either wet or dry operation.



Polishers can be arranged in tandem to perform consecutive operations, and are available in models which can be fed by conveyor, pinch rolls, or coiling equipment.

For more information, *write* Murray-Way Corp., Box 180, Maple Road East, Birmingham, Mich.

Helicopter Manufacturer Specifies



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NEW literature

Write directly to the company for a copy

Automatic Machine Programing

The operation and maintenance of this company's tape control system is discussed in an 11 page brochure. Potter & Johnston Co., West Hartford, Conn.

Chain Belt Data

Two handbooks outline installation, operation, and maintenance procedures for chain drives (Bulletin 59126) and chain conveyors and elevators (Bulletin 59127). Chain Belt Co., Milwaukee 1, Wis.

Arcwelding Stainless Steels

Recommended procedures for arcwelding of austenitic and ferritic stainless steels to themselves and to carbon, chromium, molybdenum, and other stainless steels are listed in two data sheets: TDC-155 and TDC-162. Babcock & Wilcox Co., 161 E. 42nd St., New York, N. Y.

Pump Catalog

"Pic-A-Pump," catalog, gives 576 pages of engineering data to help you select pumping units and materials of construction to meet specific applications. Allis-Chalmers Mfg. Co., P.O. Box 512, Milwaukee 1, Wis.

Resistance Welding Machine

Three catalogs describe roll, spot, and seam resistance welders. Precision Welder & Flexopress Corp., 3520 Ibsen Ave., Cincinnati 9, Ohio.

Metallurgical Products

A booklet describes 60 chemicals, metals, and minerals. Included are lithium, electromanganese, zirconium, nickel, cobalt, ferroalloys, and metal powders. Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.

Facts on Laminated Plastics

More than 50 industrial Formica laminated plastic grades, for products ranging from truck wheels to printed circuits are described in a Designer's Fact Book. Formica Corp., 4614 Spring Grove Ave., Cincinnati 32, Ohio.

Machine Tool Catalog

A 48 page catalog gives complete specifications and descriptions of Walker-Turner drill presses, grinders, cutoff machines, hand saws, and belt and disc surfaces. Dept. 1009, Walker-Turner Power Tool Div., Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

High Speed Indexing Units

Catalog No. 108 gives data on high speed, precision, roller gear drive indexing mechanisms for achieving intermittent and oscillating motions. Ferguson Machine Corp. of Indiana, 7818 Maplewood Industrial Court, St. Louis 17, Mo.

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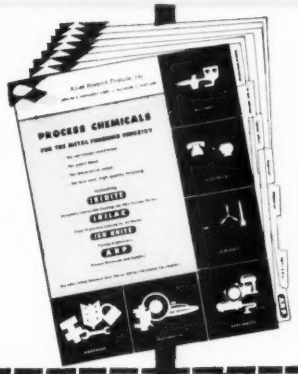

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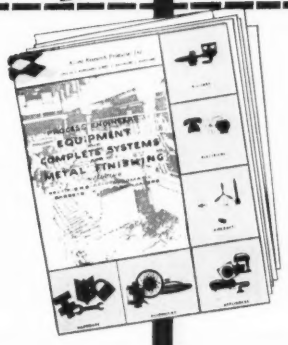

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Acme-Newport

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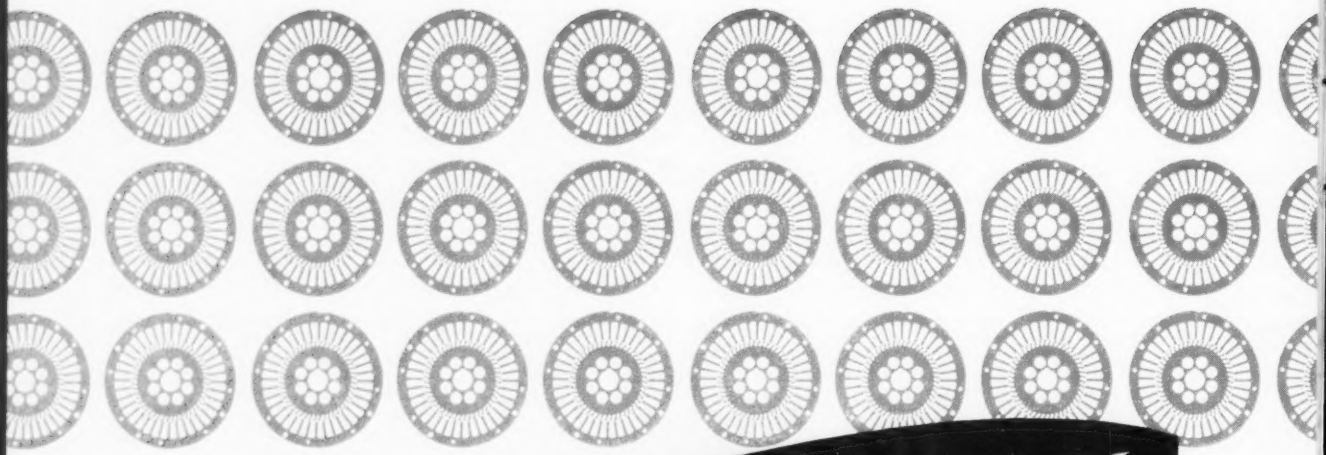

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Electrical sheets from Acme-Newport consistently punch fast, clean and with extreme accuracy . . . because the steel itself is scientifically controlled through every stage of processing. This basic steel producer melts all silicon grades in modern electric furnaces, recognized for their superior quality. Rolling, annealing and finishing are equally exacting. The result is uniformity in electrical and magnetic properties, as well as in physical characteristics, ensuring dependable performance in motors, generators and other electrical products.

Acme-Newport offers technical skills and efficient facilities to meet your most demanding steel requirements. Our engineers will be glad to discuss your specific needs.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

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Hot Rolled Steel in Coil • Hot Rolled Pickled Steel in Coil • Hot Rolled Sheets • Hot Rolled Pickled Sheets • Cold Rolled Steel in Coil (*full hard only*) • Cold Rolled Sheets • Alloy Sheets and Plates • Plates (5/16" *and lighter*) • Electrical Sheets • Electric Weld Line Pipe • Spiral Welded Pipe

July 20, 1959

Strike Won't Be Felt for a Month

STEEL USERS are better prepared for a strike than ever before. Warned months ago that the industry would drive a hard bargain in contract talks with the union, consumers started building their stocks in earnest when they learned that David J. McDonald wanted a "billion dollar bundle."

Since the first of the year, users have upped their inventories from 13 million to 21 million tons. Although stocks are 4 million tons less than they were on the eve of the 1956 strike, they are better balanced. This time hardly anyone will have trouble for at least a month. Imbalances won't show up in less than six weeks.

Major consumers are especially well prepared. Automakers have enough steel to wind up production of their 1959 models and make a good start on next year's cars. Consumption will be low during the next few weeks because of model changeovers. Appliance makers are set for 60 to 90 days.

AUTO SUPPLIERS ANXIOUS—Although they've done a good job of expanding their own inventories, automakers are concerned about suppliers' stocks. In some cases, stampers have enough steel for only 22 working days. If they can't get what they need from service centers, the carbuilders may come to their aid by encouraging other venders to ship them surplus tonnage. Should the strike go into September, a shortage of parts might force automakers to limit their initial buildup of 1960 models to 350,000 units instead of 500,000. That could have an adverse effect on sales which are now expected to reach 5.8 million.

SHEETS AND PLATES TIGHT—The two week extension of bargaining on terms of a new labor contract helped steelmakers reduce June's carryovers, but it didn't permit them to ship all of their back orders on sheets and plates. Midwestern plate producers report that July bookings are heavier than June's. August is nearly sold out, and September entries are "gratifying." At Chicago, plates and galvanized sheets are in strongest demand and shortest supply. In the East, cold rolled and galvanized items are tight. In spite of a contract extension, producers were two weeks behind schedule on shipments when the strike began.

FOREIGN STEEL PRICES UP—Anticipating steel shortages in U. S., importers have advanced their prices on bars, shapes, and plates, and most wire items from western Europe. Since February, standard structurals have gone up $15.40 a ton; merchant bars, $17.20; and reinforcing bars, $19.80 (at ports in the Southwest).

SCRAP DEALERS OPTIMISTIC—Although they expect scrap prices to soften during the first weeks of a strike, dealers are counting on a strong recovery. They reason that steelmakers will fall far behind on ore receipts from the Great Lakes. When production resumes they'll be more dependent on scrap.

INGOT RATE PLUMMETS—As a result of the strike, steelmaking operations fell 49.5 points last week to 30 per cent of capacity. Production was about 849,000 ingot tons.

WHERE TO FIND MARKETS & PRICES

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*Current prices were published in the July 13 issue and will appear in subsequent issues.

Metalworking Outlook—Page 39 Technical Outlook—Page 83

Designed with Your Needs in view...

STRAIGHT WIRE

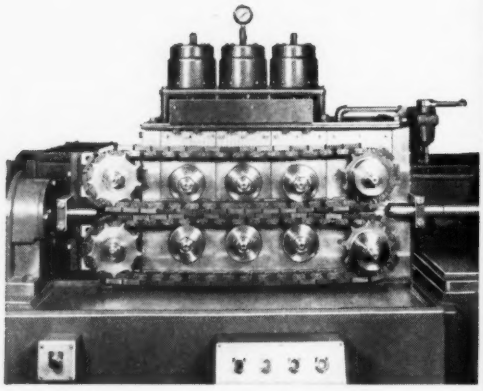
in precision-cut lengths up to 300 feet per minute

A quick-loading reel is designed to facilitate accurate starting of wire coils into chain feed . . . and to protect the operator from the revolving pay-off coil.

The Vaughn® MOTOMATIC

Wire Straightening and Cutting Machine

Features **electric variable speed drive,** with full range speed control at operator's station . . . **adjustable center straightener arbor** that accommodates wide range of wire sizes . . . **caterpillar chain feed** which eliminates twist and processes entire coil, end-to-end . . . and an **accurately synchronized flying shear cut-off.** Keeps scrap to minimum . . . reduces labor, time and fatigue . . . and delivers uniform diameter and precision-cut lengths of straight wire. ● Full details in Bulletin 751—write for your copy. Consultation and quotations gladly provided on request.



The caterpillar chain feed grips wire firmly without distortion, eliminating twist . . . and feeds the entire coil ends through the machine, saving wire scrap and operator time.

The VAUGHN MACHINERY COMPANY

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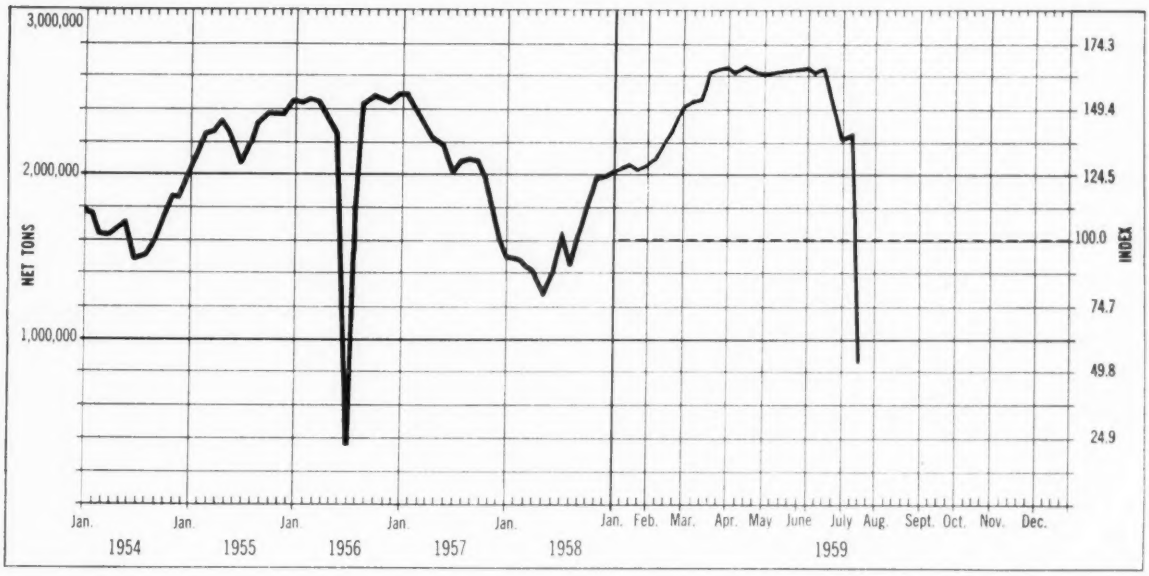
COMPLETE COLD DRAWING EQUIPMENT . . . Continuous or Single Hole . . . for the Largest Bars and Tubes . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

Steel Production Nose-Dives to 30%



Weekly production of steel ingots and castings.
(Tonnage for week ended July 19 estimated by STEEL; others reported and charted by American Iron & Steel Institute.)

STEELMAKING operations last week plunged 49.5 points to 30 per cent of capacity as the steelworkers hit the bricks in the first industry-wide strike since 1956. The rate would have dropped more were it not for the fact the walkout didn't come until midweek. In 1956, it dropped to around 12.5 per cent of the then rated capacity.

Production for all of last week totaled only 849,000 net tons vs. 2,250,000 the week preceding when the ingot rate (revised) averaged 79.5 per cent (see chart). Output will be still less this week since only about 56 steelmakers with weekly capacity of 368,000 tons (13 per cent of the national total) continue to operate on extended or unexpired labor contracts.

In the last ten years there have been three previous strikes, in 1949 (32 days), in 1952 (55 days), and in 1956 (33 days). Some authorities think a short strike will not be too seriously felt by the economy, but it's said that for every day of work stoppage beyond four weeks, an increasingly adverse influence will be reflected in over-all business and industry.

• **Record Unlikely**—The walkout may mean we won't see a record for annual production. The industry had been well on its way to a new high (over 117 million tons). In the first half of the year it poured a record 64,278,569 net tons. That topped the previous first half high mark of 62,607,000 tons set in 1956, another strike year.

Steelmen had expected to produce 51 million to 53 million net tons

Steel Ingot Production—Six Months, 1959

Period	OPEN HEARTH (Net tons)	BESSEMER (Net tons)	OXYGEN PROCESS (Net tons)	ELECTRIC (Net tons)	TOTAL (Net tons)	Per cent of capacity
1959						
January ...	8,280,985	120,005	186,820	729,575	9,317,385	74.3
February ..	8,541,031	128,515	176,970	756,422	9,602,938	84.8
March	10,216,474	184,892	236 595	929,784	11,567,745	92.3
1st. Qtr. ..	27,038,490	433,412	600,385	2,415,781	30,488,068	83.8
April	9,884,322	195,730	237,018	964,850	11,281,920	93.0
*May	10,117,968	200,887	257,325	1,024,401	11,600,581	92.5
†June	9,522,000	186,000	259 000	941,000	10,908,000	89.9
†2nd Qtr. .	29,524,290	582,617	753,343	2,930,251	33,790,501	91.8
†1st Half .	56,562,780	1,016,029	1,353,728	5,346,032	64,278,569	87.8

	—OPEN HEARTH—		—BESSEMER—		—ELECTRIC—		—TOTAL—	
Period	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1958								
January ..	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,912	56.5
February .	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782 323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr. ..	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109.433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301 159	52.7
June	6,378,942	63.4	88,125	26.6	660,413	55.8	7,127,480	61.6
2nd Qtr. ..	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo...	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1

Note—The percentages are based on annual capacities as of Jan. 1, 1959: Open hearth, 126,528,380 net tons; bessemer, 3,577,000 net tons; basic oxygen process, 4,033,160 net tons; electric and crucible, 13,495,130 net tons. Total: 147,633,670 net tons. In 1958, the capacity tonnages were: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric and crucible, 14,393,740 net tons. Total: 140,742,570 net tons.
*Revised. †Preliminary.

of ingots in the last half if there were no strike. They thought operations for the year would average around 79 per cent vs. 60 per cent in 1958 when 85 million tons were produced. The record was set in 1955 when 117 million tons plus were poured.

• **Second Quarter Up**—The output record of the first six months this year (see table) compares with production of 37,752,487 in the first half of last year and with 47,502,398 tons in the last six months of 1958.

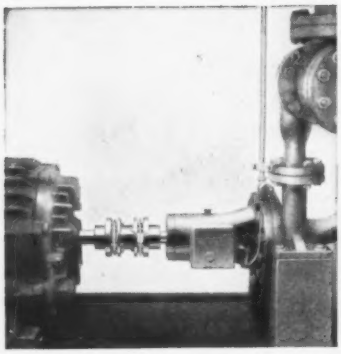
Output for the second quarter of 1959 also set a record at 33,790,501 tons, as did June output at 10,908,000 tons. The previous record for any quarter was 32.4 million in the fourth period of 1956. Second quarter production compares with 30,488,068 tons in the first quarter and 18,961,630 tons in the second quarter of 1958.

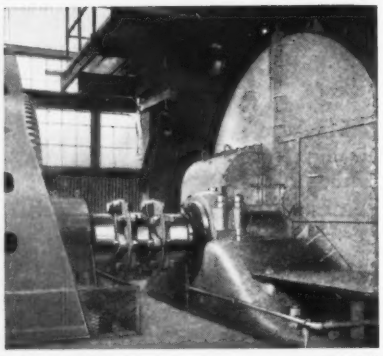
The American Iron & Steel Institute's index of steelmaking in the first half of 1959 was 154.8 in terms of average production during the base period (1947-49) compared with 90.9 in the first half of 1958. The index figure for the second quarter this year was 161.8 vs. 90.8 a year ago. The June index was 158.4 vs. 163.1 in May, when output hit an all-time monthly peak of 11,600,581 tons. In June a year ago the index stood at 103.5.

Based on Jan. 1, 1959, capacity of 147,633,670 net tons, the steelmaking facilities operated at an average of 87.8 per cent during the first half of this year, 91.8 per cent during the second quarter, and 89.9 per cent during June.

Once the strike is settled, it's expected it will take several weeks for the industry to resume full-scale operations. However, order backlogs for the remainder of third quarter are substantial, and indications are fourth quarter volume will be up sharply to support high level production in the closing three months of the year.

Protect your PUMPS and other Indispensable MACHINERY with THOMAS FLEXIBLE COUPLINGS





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Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.
They will protect your equipment and extend the life of your machines.
Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

UNDER LOAD and MISALIGNMENT ONLY THOMAS FLEXIBLE COUPLINGS OFFER ALL THESE ADVANTAGES:

- Freedom from Backlash
- Torsional Rigidity
- Free End Float
- Smooth Continuous Drive with Constant Rotational Velocity
- Visual Inspection While in Operation
- Original Balance for Life
- No Lubrication
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- No Maintenance

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

Canadian Steel Output Up 18.9% in First Half

Production of iron and steel in Canada in the first six months shows a substantial gain over that in the like period of 1958.

Steel ingot output totaled 2,768,435 net tons, up 18.9 per cent from the 2,327,340 tons produced in the corresponding six months of last year.

Production of pig iron was 2,016,105 tons, a jump of 26.5 per cent over the 1,593,498 tons produced in the first half of 1958.

Tin Plate . . .

Tin Plate Prices, Page 132

Demand for tin plate continued strong right up to the zero hour in the steel labor contract negotiations. Producers shipped out tonnage right up to the deadline in an effort to get current with demand. In most cases, they were about 10 days behind shipment promises.

If only a short strike is experienced, tin mill operations will probably average 75 to 80 per cent of capacity during the third quarter. Several makers are sold out for the period.

Fourth quarter books haven't

been officially opened, but, as usual, steelmakers will accept orders for that period from contract customers.

Wire . . .

Wire Prices, Pages 132 & 133

Some wire mills have labor contracts that do not expire for some time. Extension of the wage negotiations to July 15 permitted the producers to ship out considerable backed up tonnage, so that they have been able to catch up with delayed shipments.

Third quarter activity is likely to be slower than that in second quarter even if only a short strike is experienced. Some mills' operations are curtailed for vacations, and operations will likely be affected all summer for that reason.

Order bookings have been substantial for July and August shipment, and some September business is beginning to come in. Most consumers are not overloaded with inventories.

Higher Prices Now Quoted On Some Imported Steel

Imports of steel mill products set a monthly record in April, and exceeded exports for the fifth straight month, reports the American Iron & Steel Institute. The month's total was 359,450 net tons vs. 287,417 in March this year and 114,024 in April, 1958.

Exports amounted to 178,029 net tons vs. 177,901 in March this year and 266,943 in April last year.

The import total for the first four months this year set a record at 1,117,005 tons. In the period, exports amounted to only 684,891 tons, the lowest in 20 years.

Prices have been advanced on imported steel bar products, shapes, plates, and most wire items from Western Europe, in some cases sharply. But quotations on imported sheets and furring channels, and on hot rolled bands are easier; and there is a slight softening in nail prices noted at South Atlantic, Gulf, and West Coast ports.

The European mills are running behind on commitments for plates, shapes, and wire products. They have little to offer for delivery before October and November.

Texas steel mill executives are more concerned about competition from foreign steel than they are about a strike. While prices on imports continue to rise, foreign mills are still underselling Texas producers by an average of $28 a ton.

During the first half of this year, the Texas mills operated at capacity, but at the same time 330,000 tons of foreign steel was shipped through the Galveston-Houston ports. In 1958, a total of 300,000 tons entered through those ports and an additional 100,000 tons through other Texas ports.

Importers in the Southwest are cashing in on consumers' attempts to stockpile steel. New price lists show standard structural shapes have climbed $15.40 a ton since February. Merchant bars are up $17.20 a ton, reinforcing bars are up $19.80, and H-beams $18.60.

Plates . . .

Plate Prices, Page 130

While the two weeks labor truce this month enabled makers of sheared plate to get fairly caught up on shipment arrearages, a strike

Steel Service Centers throughout the country have built up their inventories in anticipation of a suspension in steel production. These stockpiles totaling almost 3,600,000 tons are valued at ¾ billion dollars. If you have been using a steel service center as your source of supply—you can thank your lucky stars—because chances are they will still be able to fill your requirements.

Each distributor's representative is a metal specialist and is qualified to assist you with application and supply problems.

MICROROLD STAINLESS STEEL is regularly carried in stock in 252 of these independent steel warehouses. Washington Steel is a producer of sheet and strip exclusively, all of which is precision rolled on Sendzimir mills.

WASHINGTON STEEL CORPORATION

72-0 Woodland Avenue, Washington, Pa.

Job report courtesy of
Electric Steel Foundry Company, Portland, Oregon

When nuclear applications call for stainless welds of highest quality

WELD WITH ARCOS

STAINLESS ELECTRODES

This is part of a 3900 lb. stainless pump-volute casting for a submarine nuclear power plant. In the photo, a skirt is being welded to the casting using 5/32" dia. Arcos Chromend K Electrodes. To minimize stresses, a step-back and skip procedure was used. These welds conformed to Class I Navy radiographic standards—an indication of the dependability of standard Arcos electrodes for your stainless welding needs. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Pa.

will quickly set them right back where they were, and, if prolonged, will push deliveries well into the fall. Producers have good bookings through August and some pickup in demand for September tonnage is reported.

Three large platemakers in the East—Alan Wood, Lukens, and the Plate Div., Phoenix Steel Corp., will not be immediately affected by a strike as their labor agreements do not expire until later.

New Electrical Steel Introduced by Armco

A new grade of electrical steel, Armco Oriented M-5, is being introduced by Armco Steel Corp., Middletown, Ohio. It is said to offer improved quality which permits redesign of transformers to a smaller size, or makes it possible to increase efficiency.

The company says the core loss limit is 0.58 watts per pound when tested under the standard conditions of 15 kilogausses and 60 cycles.

The grade is produced in 12 mil thickness and in coils $\frac{1}{8}$ in. to 31 in. wide. Insulations can be the natural annealing oxide for wound distribution transformer cores, or the thin, high resistivity Carlite for cores of stacked power transformers.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 131 & 132

Sheet buyers have good inventories of hot rolled and flat specialties, but they are relatively short on cold rolled and galvanized sheets. Most of them can carry on operations for possibly a month or so with such stocks as they have, but most of them have been consuming steel at a faster clip than they had anticipated earlier this year. They also have been handicapped in building up stocks by delayed mill shipments.

The deferment of two weeks in the strike deadline enabled the mills to do some catching up on delivery promises, but they still are a couple weeks behind on cold rolled sheets—even more on galvanized.

• **Heavy Production** — June was a month of record or near record shipments for Pittsburgh area sheetmakers. The outturn of one producer was 10 per cent greater than

it has ever shipped before. Its best previous month was June, 1956. Then, as now, consumers were buying heavily for strike protection.

Shipments of still another district mill were the second best in its history, exceeded only by those of June, 1956.

While the two week extension of wage bargaining talks helped the mill catch up on back orders, it didn't trigger an influx of new business. Users continued to press for immediate delivery of everything they'd been promised for June, but they didn't make any strenuous efforts to pick up additional tonnage. Conversely, they showed no inclination to cancel or defer anything previously ordered.

• **Hedging Overstated**—Some sales executives think the extent of strike hedging has been overstated. One official recently polled 14 district sales managers on the question of the tonnage they'd lose if a strike were averted. All but two declared that they "wouldn't lose a pound." Most observers think 10 to 15 per cent of the business now on the books will be wiped off if there's an early settlement of the labor dispute.

Bookings for the balance of this month and for August are excellent. Most mills are sold out through August, and some are booked solidly through September on the basis of firm orders and commitments.

Demand for galvanized sheets is so strong that most producers expect capacity operations for the balance of the year.

Steel Bars . . .

Bar Prices, Page 130

Demand for hot rolled carbon bars had leveled off when the strike deadline was reached, but some mills hold substantial backlogs, being behind on commitments. There is a little carryover in cold drawn bars, but as converters have had adequate stocks of hot bars, they have been able to keep up with their delivery promises. Some cold drawers' labor agreements extend beyond July 15.

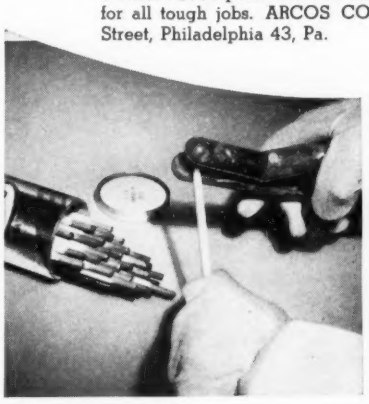
It's expected accumulation of orders will be heavy if the steel mills are closed down for a long period. However, extension of the wage bargaining period from July 1 to July 15 didn't have much impact on

Job report courtesy of
Midwest Piping Co., Inc., St. Louis, Mo.

When stainless welds must pass the most rigid tests possible

USE ARCOS QUALITY FILLER METALS

This 16" diameter Type 304 stainless elbow is part of the reactor cooling system in an atomic powered ship. In welding the two halves, the first pass was made with Arcos Chromend K (Type 308) electrodes. The balance of the joint was submerged arc welded with Arcosite Bonded Flux and Chromenar K (Type 308) wire. The inset shows results of a dramatic test of the Arcos weld metal so produced. A 2½" ring, cut from an elbow, was given the normal bend test—and then completely flattened—without a crack! Such performance is the reason why Arcos is preferred for all tough jobs. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



Arcos Chromend K
(Stainless) Electrodes

Arcos Chromenar K Bare Wire
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daddy's home!

After the hard work, the petty irritations, this is the moment that gives the day its meaning. This is the distillation of all that you are striving to preserve.

But in the routine of making a home and earning a living, there's one essential that it's too easy to overlook: your health...the health of your family.

Have you done all you can to protect yourself against cancer? *A health checkup every year is "living insurance."*

Have you done your share to protect your children? *Today's research will mean better methods of treatment, possibly prevention, tomorrow.*

Let the glow of your next homecoming be your reminder: *Guard Your Family—Fight Cancer with a Checkup and a Check.*

Send your check to "Cancer," *c/o your local post office.*

American Cancer Society

BOLT DISCOUNTS

(Apply to list prices effective June, 1959)

Consumer Discount Sheet (Multipliers in parentheses)	F.O.B. Plant-Port Chester, N. Y., Coraopolis, Pa., or Rock Falls, Ill. Base 1 Container	40,000 lb.
Bolts—Standard stock sizes		
Plain finish, packaged & bulk	50.00% (0.5000)	58.00% (0.4200)
Hot Galvanized		
Packaged	43.75% (0.5625)	52.75% (0.4725)
Bulk	50.00% (0.5000)	58.00% (0.4200)

Notes: 1. For less than container quantities: Add 25%.
2. Nonstock sizes: Prices on application.
3. Attaching nuts to bolts, package sizes (whether ordered in packages or in bulk: Add 7½%.
4. Minimum hot galvanizing charge: $10 per item.
5. Discounts are determined by the quantity of bolts, nuts, screws, and rivets ordered for shipment to one destination at one time.

Plating—For bolts with commercial thickness of plating add:

Bolt sizes	Electro Zinc Plating and Parkerizing	Cadmium Plating
Thru ⅝ in. by 6 in.	3½ cents per lb net	5½ cents per lb net
¾ in. thru 6 in.	4 cents per lb net	6 cents per lb net
Larger and longer	6 cents per lb net	8 cents per lb net

Minimum plating charge: $10 per item.

NUT DISCOUNTS

Discounts apply to list prices effective June, 1959

Consumer Discount Sheet (Multipliers shown in parentheses)	F.O.B. Plant-Port Chester, N. Y., Coraopolis, Pa., or Rock Falls, Ill. Base 1 Container	50 Containers and More
Hex Nuts (finished & regular—all styles)		
Packaged and bulk ¼ in. thru 1½ in.	50.00% (0.5000)	58.00% (0.4200)
Heavy Hex Nuts (all styles)		
Packaged and bulk ¼ in. thru 1½ in.	50.00% (0.5000)	58.00% (0.4200)
Square Nuts—regular and heavy		
Packaged and bulk ¼ in. thru 2 in.	50.00% (0.5000)	58.00% (0.4200)

Notes: 1. For less than container quantities: Add 25%.
2. Sizes 1⅝ in. and larger hex nuts: Price on application.
3. Nonstock nuts: Price on application.
4. Heavy hex nuts 1⅛ in. thru 1½ in. tapped 8 threads: Add 10%.

Plating—Commercial thicknesses, add the following net extras:

Nut Sizes	Electro Zinc Plating and Parkerizing	Cadmium Plating	Hot Galvanized
¼ in. and ⅞ in.	3½ cents per lb net	5½ cents per lb net	12 cents per lb net
⅜ in. thru ⅞ in. inc.	3½ cents per lb net	5½ cents per lb net	9 cents per lb net
⅝ in. thru 1 in. inc.	3½ cents per lb net	5½ cents per lb net	7 cents per lb net
1⅛ in. thru 1½ in. inc.	4 cents per lb net	6 cents per lb net	7 cents per lb net

Minimum plating charge: $10 per item.

Carburizing—Commercial Thicknesses—

Nut sizes ¼ in. thru 1½ in. ..... 5 cents per lb net extra

Minimum carburizing charge: $15 per item.

CAP AND SET SCREW DISCOUNTS

Consumer Discount Sheet (Multipliers in parentheses)	F.O.B.-Port Chester, N. Y., Coraopolis, Pa., or Rock Falls, Ill. Base Packages	Base Bulk
Hexagon Head Cap Screws, UNC or UNF		
Bright & High Carbon Heat Treated		
(Lists effective June, 1959)		
Thru 1 in. X 6 in.	45.00% (0.5500)	67.00% (0.3300)
For less than container quantities: Add 25%.		
Bright		
(Lists effective July, 1956)		
¼ in. thru ⅝ in. X longer than 6 in.	3.00% (0.9700)	3.00% (0.9700)
¾ in. thru 1 in. X longer than 6 in.	Plus 11.00% (1.110)	Plus 11.00% (1.110)
High Carbon Heat Treated		
(Lists effective July, 1956)		
¼ in. thru ⅝ in. X longer than 6 in.	Plus 19.00% (1.190)	Plus 19.00% (1.190)
¾ in. thru 1 in. X longer than 6 in.	Plus 39.00% (1.390)	Plus 39.00% (1.390)
Fillister Head, coarse thread		
(Lists dated Aug. 11, 1931)	Packages	Bulk
Listed sizes	Plus 55.00% (1.550)	Plus 16.00% (1.160)
Flat Heads, coarse thread		
(Lists dated Aug. 11, 1931)		
¾ in. diameter and smaller X 6 in. and shorter	Plus 85.00% (1.850)	Plus 38.00% (1.380)
Set Screws, Square Head, Cup Point, coarse thread		
(Lists dated Feb. 1, 1924)		
6 in. and shorter thru 1 in. diameter	Plus 5.00% (1.050)	19.00% (0.8100)
Longer than 6 in. thru 1 in. diameter	Plus 29.00% (1.290)	.....

Note: For fillister and flat head cap screws and set screws bulk discounts listed apply only to items ordered in minimum quantities:

¼ in. to ⅜ in. diameter inclusive	15,000 pieces
7/16 in. to ⅝ in. diameter inclusive	5,000 pieces
¾ in. to 1 in. diameter inclusive	2,000 pieces

For bulk shipments of smaller quantities, package discount shall apply.

Discounts apply to shipment to one destination at one time.

Plating—For cap and set screws with commercial thickness of plating, add net extras:

Sizes	Electro Zinc Plating and Parkerizing	Cadmium Plating
Thru ⅝ in. X 6 in.	3½ cents per lb net	5½ cents per lb net
¾ in. diam. thru 6 in.	4 cents per lb net	6 cents per lb net
Larger and longer	6 cents per lb net	8 cents per lb net

Minimum plating charge: $10 per item.

sales of hot bars, though it gave producers a chance to ship out a little more tonnage on old orders.

June shipments were on a par with May's, but the trend began to turn downward in the first two weeks of this month. Shipments in the period were off an estimated 15 per cent. That's surprising in view of consumers' anxiety to protect themselves against a strike that had been merely postponed, not called off. Steelmakers say two factors are responsible: The July 4 holiday and vacation shutdowns at some manufacturing plants.

The mills are pretty well booked for August, but they were still accepting orders at mid-July.

Sierra Drawn Steel Corp., Los Angeles, has started production of cold drawn steel bars from ⅛ to 4 in. in rounds, and 3/16 to 2½ in. in hexagons.

RBW's New Fastener Price Lists Studied by Trade

Most bolt and nut producers are not expected to make any move with respect to pricing until a steel wage settlement is made, despite the recent action of Russell, Burdsall & Ward Bolt & Nut Co. in issuing new list prices and discounts, effective late last month. All sellers, however, are expected to meet competition where necessary to hold customers. That's common practice in the industry.

The new RBW lists make some slight price adjustments, up and down. An official of the company says the cards simplify its method of pricing, quotations on the various products now being established by several lists, rather than all products being based on a single list.

RBW's new consumer discounts are shown in the accompanying table.

Structural Shapes . . .

Structural Shape Prices, Page 130

Structural fabricators report new orders are spotty, involving public work for the most part. Most fabricating shops are fairly well booked ahead and are estimated to have an average of about two months' supplies of plain structurals. Wide flange beams are in tightest supply.

Several of the major fabricating shops will be closed by the steel

strike, but many shops will continue to operate since their wage agreements do not expire for some time.

While construction in general has been moving along well this summer, there is growing evidence that road building programs are going to lag behind expectations. Illinois, for example, has just canceled some plans because funds to pay for them are not in sight.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

970 tons, Sections 5 and 6 (east approach), George Washington Bridge, New York, through Gull Contracting Co., Flushing, L. I., to Harris Structural Steel Co., New York.

700 tons, Section 9 (east approach), George Washington Bridge, New York, through Johnson, Drake & Piper, New York, to Harris Structural Steel Co., that city.

STRUCTURAL STEEL PENDING

169 tons, state bridgework, New Jersey, bids July 29; 89 tons for a project in Morris County and 80 tons for another in Middlesex County; the two projects will also take a combined total of 65 tons reinforcing steel.

REINFORCING BARS . . .

REINFORCING BARS PENDING

3000 tons, bleached kraft pulp mill, Castlegar, British Columbia; general contract to Gilpin Construction Co. and Henry J. Kaiser Co. Canada Ltd., Vancouver, B. C.; Celgar Ltd., owners.

878 tons, state bridgework, Somerset County, New Jersey, bids July 28; also, 3039 tons of structural steel required.

113 tons, state bridgework, Westmoreland County, Pennsylvania, bids July 31; also, 292 tons of structural shapes required.

PLATES . . .

PLATES PLACED

280 tons, wind tunnel, Tullahoma, Tenn., through Kammer Construction Co., to Ingalls Iron Works Co., Birmingham.

PLATES PENDING

560 tons, sheet piling concrete pier, Portland, Oreg.; C. M. Corkum & Sons, Portland, low at $2,249,000, to Commission of Public Docks.

PIPE . . .

CAST IRON PIPE PLACED

263 tons, 6 to 20 in., Empire Way South, Seattle, to U. S. Pipe & Foundry Co., Seattle.

165 tons, 6 and 12 in., Bremerton, Wash.; also 78 tons, 10 to 18 in., Sitka, Alaska, to Pacific States Cast Iron Pipe Co., Seattle.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Western Pacific, six 2000-hp road switching locomotives, to Electro-Motive Div., General Motors Corp., LaGrange, Ill.

RAILROAD CARS PLACED

Soo Line, seventy-five 70-ton covered hopper cars, acquired under lease arrangement.

Burlington, heavy repairs to 500 fifty-five-ton composite hoppers, 498 seventy-ton hoppers, 1000 boxcars, 177 double-door auto boxcars, and 35 fifty-ton steel gondolas to its own shops.

Chicago & Northwestern, repair and upgrading of 5700 boxcars, 728 flatcars, 384 seventy-ton ore cars, 306 ballast cars, and 282 special-device cars; contemplated for its Clinton shops.

Shipments of Steel Products—May, 1959

(Net tons; all grades)

Products:	Carbon	Alloy	Stainless	Year to Date 1959	1958
Ingots	16,749	12,858	3,014	136,511	121,910
Blooms, etc.	123,539	58,092	2,216	785,982	463,130
Tube rounds	1,008	166	.....	7,589	3,281
Skelp	12,206	.....	.....	29,964	37,903
Wire rods	122,364	3,137	1,318	585,175	322,833
Structurals	531,917	6,902	12	2,293 793	1,655,819
Steel piling	54,303	.....	.....	192,454	169,605
Plates	636,010	60,827	4,257	3,130,292	2,248,248
Rails (standard)	99,863	.....	.....	400 702	274,652
Rails (other)	4,922	.....	.....	21,984	17,101
Joint bars	5,264	.....	.....	19,246	17,911
Tie plates	28,229	.....	.....	96,584	58,568
Track spikes	7,280	.....	.....	28,540	18,678
Wheels	31,139	58	.....	110,997	79,531
Axles	15 437	22	.....	51,935	43,791
Bars HR	681,825	203,271	5,112	3,839,885	2,044,971
Bars—reinforcing	256,318	.....	.....	1,048,315	732,875
Bars CF	147,163	26,641	6,801	767,406	387,013
Tool steel	1,407	8,602	.....	42,809	29,195
Standard pipe	297,409	196	.....	1,194,138	817,663
Oil country goods	227,006	48,547	.....	1,203,865	486,338
Line pipe	443,140	41	.....	1,632 463	1,054,162
Mech. tubing	65,516	29,576	404	413,874	216,015
Pressure tubing	21,867	5,408	1,559	133,270	106,697
Drawn wire	333,253	4,971	3,729	1,386,875	895,343
Nails & staples	50,600	.....	2	200,534	170,940
Barbed wire	7,000	.....	.....	30,207	31,058
Woven fence	21,019	.....	.....	89,878	90,601
Bale ties, etc.	8,863	.....	.....	33 950	25,713
Black plate	76,935	.....	.....	331,450	256,428
Tin plate HD	64,110	.....	.....	220,628	179,003
Tin plate—electro	689,064	.....	.....	2,836,305	2,169,821
Sheets HR	916,216	29,457	1,667	4,332,398	2,187,111
Sheets CR	1,471,259	6,957	17,359	7,240,839	3,575,081
Sheets—galvanized	316,326	733	.....	1,526,350	989,261
Sheets—other	29,270	.....	.....	137,239	62,119
Elec. sheets—strip	5,597	68,323	.....	324,415	181,514
Strip HR	156,566	3,346	1,018	705,676	355,209
Strip CR	121,249	2,142	26,170	654,623	375,208
Total (1959)	8,099 208	580,273	74,638	38,219,140	.....
Total (1958)	4,383,961	229,959	35,579	.....	22,952,300

Data from American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended July 19‡	Change	Same Week 1958	1957
Pittsburgh	24.5	—54.5*	46	83.5
Chicago	35	—54.5*	60.5	84
Eastern	65	—26	63	90
Youngstown	33	—57	49	79
Wheeling	62.5	—22*	73.5	77
Cleveland	23	—59.5*	46	78
Buffalo	30	—75	44	88
Birmingham	13.5	—81.5	53.5	91.5
Cincinnati	58	—35.5	39	62
St. Louis	83	+ 1.5*	92.5	84.5
Detroit	40	—42*	58.5	86.5
Western	75	—10	67	99
National Rate	30	—49.5*	55.5	81

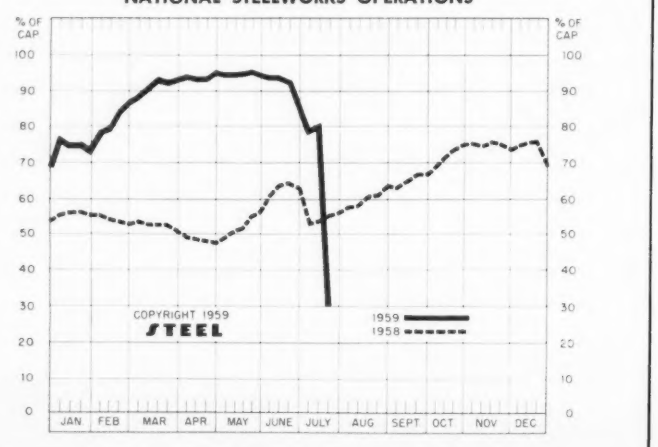
INGOT PRODUCTION

	Week Ended July 19	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	52.9†	140.2	163.1	92.2
NET TONS (In thousands)	849†	2,252	2,620	1,481

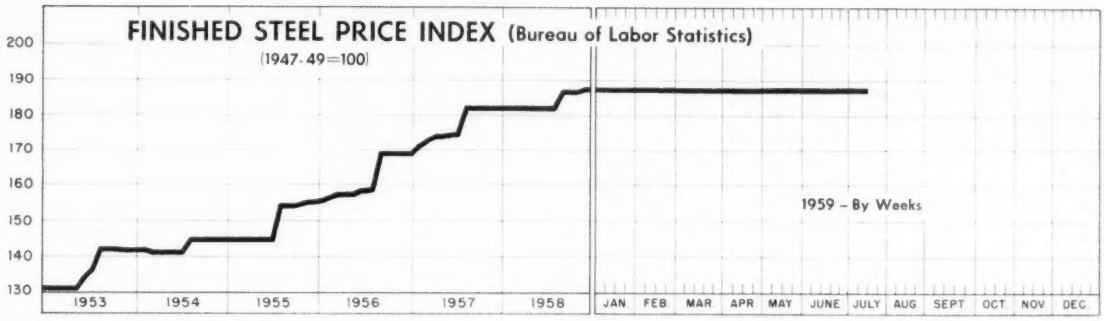
*Change from preceding week's revised rate. †Estimated by STEEL; comparative figures reported by AISI.

Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957. ‡Preliminary.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 14, 1959	Week Ago	Month Ago	June Avg.	Year Ago
186.7	186.7	186.7	186.7	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 14

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.025
Strip, C.R., Carbon	9.189
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.722
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 15 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	195.87
Index in cents per lb	6.713	6.713	6.713	6.479	5.306

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$117.43
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	38.67	38.00	36.50	36.67	27.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	July 15 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.55
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.225
Plates, Chicago	5.30	5.30	5.30	5.10	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.45
Strip, H.R. Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	4.05
Strip, C. R., Pittsburgh	7.425	7.425	7.425	7.15	5.75
Strip, C. R., Chicago	7.425	7.425	7.425	7.15	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.15	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	5.85
Tin plate(1.50 lb)box,Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$78.00
Wire rods 7/32-5/16" Pitts.	6.40	6.40	6.40	6.15	4.675

PIG IRON, Gross Ton

	July 15 1959	Week Ago	Month Ago	Year Ago	5 yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$39.50	$39.50	$36.50	$35.50	$28.50
No. 1 Heavy Melt, E. Pa.	40.00	38.00	38.00	35.00	24.00
No. 1 Heavy Melt, Chicago	36.50	36.50	35.00	39.50	30.50
No. 1 Heavy Melt, Valley	41.50	41.50	39.50	38.50	26.50
No. 1 Heavy Melt, Cleve.	38.50	38.50	36.50	35.00	24.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	27.50	25.50
Rails, Rerolling, Chicago	59.50	59.50	58.50	57.50	42.50
No. 1 Cast, Chicago	52.50	52.50	50.50	41.50	36.00

COKE, Net Ton

Beehive, Furn., Connisvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, July 15, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 132; footnotes, page 134.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.80
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown (27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Younstown U5, Y1 ..... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa. (9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta (9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle A24, B3, N14 ..... 6.425
S.Ch'c'go(9)R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.,Calif.(9)B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Sharon,Pa. S3 ..... 6.725
Pittsburgh J5 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..... 11.75*

Alloy
Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. B5 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..... 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa. M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. R5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. B5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburgh,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 .6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2. 9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ...10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ....8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 .....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Champan&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am.Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Stee's
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellvil'e,O. S3	8.40
Newport Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y. (32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind Harbor Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	....	18.85	22.95	27.80
Buffalo W12	....	18.85	....	....
Fostoria,O. S1	....	19.05	22.15	....
FranklinPark,Ill. T6	....	19.20	23.30	28.15
Harrison,N.J. C18	....	18.85	22.95	27.80
NewYork W3	....	18.85	22.95	27.80
Palmer,Mass. W12	....	18.85	....	....
Trenton,N.J. R5	....	18.85	22.95	27.80
Worcester,Mass. A7, T6	....	18.85	22.95	27.80
Youngstown S41	....	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor, Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	16.50
Bartonville Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling N.J. R5	17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock — **Col.**

AlabamaCity,Ala. B2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	178
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10 51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$954
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS — **Col.**

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga. J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	**An'ld Stone**	**Galv. Stone**
Ala.City,Ala.R2	17.85	1940**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)	**An'ld Galv.**
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.6758
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10 50†
Rankin,Pa. A7	9.00 9 55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(1)(48)N15	9.00 9.70§§
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50, †5c, §10c, ‡Less than 10c, ††10.50c, ‡‡11.00c, **Subject to zinc equalization extras, §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., ¾ in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅞ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolt
Full Size Body (cut thread)& Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter +85.0

Setscrews, Square Head. Cup Point, Coarse Thread:
Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49 24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mills bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c or cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt. Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price or zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Neville Island, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld	....	67.95	67.95	68.48
McKees Rocks, Pa. deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
Granite City, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T2	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Calvert City, Ky. P15	$99.00
Niagara Falls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry. K2	89.00
Keokuk, Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood, Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Neville Island, Pa. P6 (Indermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡ ¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston West Decatur, Winburne, Snow Shoe, Pa., Bessemer Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $333; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48%	3:1	$42.00-44.00†
48%	2.8:1	38.00-40.00†
48%	no ratio	29.00-31.00†

South African Transvaal

44%	no ratio	19.75-21.00
48%	no ratio	29.00-31.00

Turkish

48%	3:1	51.00-55.00†

Domestic

Rail nearest seller

18%	3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam (in.)	Length (in.)	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.10-50.70†
Bronze, 5000-lb lots	52.20-56.20†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.70-57.10†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition: ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.03	$6.03	$5.98	$5.88	$6.34
Bar Size Angles	6.03	6.03	5.98	5.88	6.34
Structural Angles	5.93	5.93	5.88	5.78	6.18
I-Beams	5.93	5.93	5.88	5.78	6.18
Channels	5.93	5.93	5.88	5.78	6.18
Plates (basic bessemer)	5.70	5.70	5.65	5.55	5.95
Sheets, H.R.	7.00	7.00	6.95	6.85	7.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.30	9.30	9.25	9.15	9.65
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.45	9.45	9.40	9.30	9.70
Sheets, C.R. (drawing quality)	8.50	8.50	8.45	8.35	8.75
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.22	25.06	24.91	24.61	26.28
Barbed Wire (†)	7.15	7.15	7.10	7.00	7.40
Merchant Bars	6.08	6.08	6.03	5.93	6.33
Hot-Rolled Bands	6.00	6.00	5.95	5.85	6.25
Wire Rods, Thomas Commercial No. 5	6.10	6.15	6.10	6.00	6.35
Wire Rods, O.H.	6.55	6.60	6.55	6.45	6.80
Bright Common Wire Nails (§)	7.65	7.65	7.60	7.50	7.90

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Ovens Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

This is all the room you need to weld with LINDE's "MIGHTY MIDGET"

. . . New Heliarc HW-20 Torch

HIGH CURRENT CAPACITY

Operates at 200 amperes *continuous* duty, AC or DC. Molded, totally closed water-cooling system eliminates any chance of leaks at torch head.

MINIATURE SIZE

9/16- by 2-5/16-in. torch head permits welding in hard-to-reach areas as small as 3 in. in diameter. Total torch length is under 7 inches.

3.3-OZ. FEATHERWEIGHT

Selected materials, such as glass fiber reinforced phenolic plastic, save weight without sacrificing strength. Torch (with short cap) weighs only 3.3 ounces.

HANDLES LIKE A PENCIL

Exceptional balance, light weight, small size, and super-flexible service lines make the HW-20 torch as easy to handle as a pencil.

For further information, call your local LINDE Office or LINDE Distributor . . . or write: Dept. 5-073, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York.

SPECIFICATIONS

Capacity —
200 amp. AC or DC, continuous duty cycle;
225 amp. AC or DC, reduced duty cycle

Weight —
with short cap: 3.3 oz.*
with medium cap: 3.5 oz.
with long cap: 3.6 oz.

Length overall — 6⅞ in.

Length of Torch Head —
with short cap: 2-19/64 in.*
with medium cap: 3-9/32 in.
with long cap: 7-5/16 in.

Maximum Handle Diameter — ¾ in.

Maximum Head Diameter — 9/16 in.

Service Lines — 12½ or 25 ft.

*Torch is supplied with medium cap for 3-in. electrodes. Short cap for 2-in. electrodes and long cap for 7-in. electrodes are available as accessories.

Linde UNION CARBIDE

The terms "Heliarc," "Linde," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max), 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29. 40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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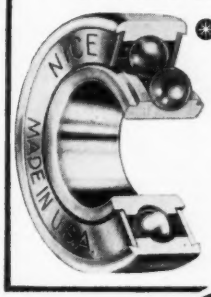

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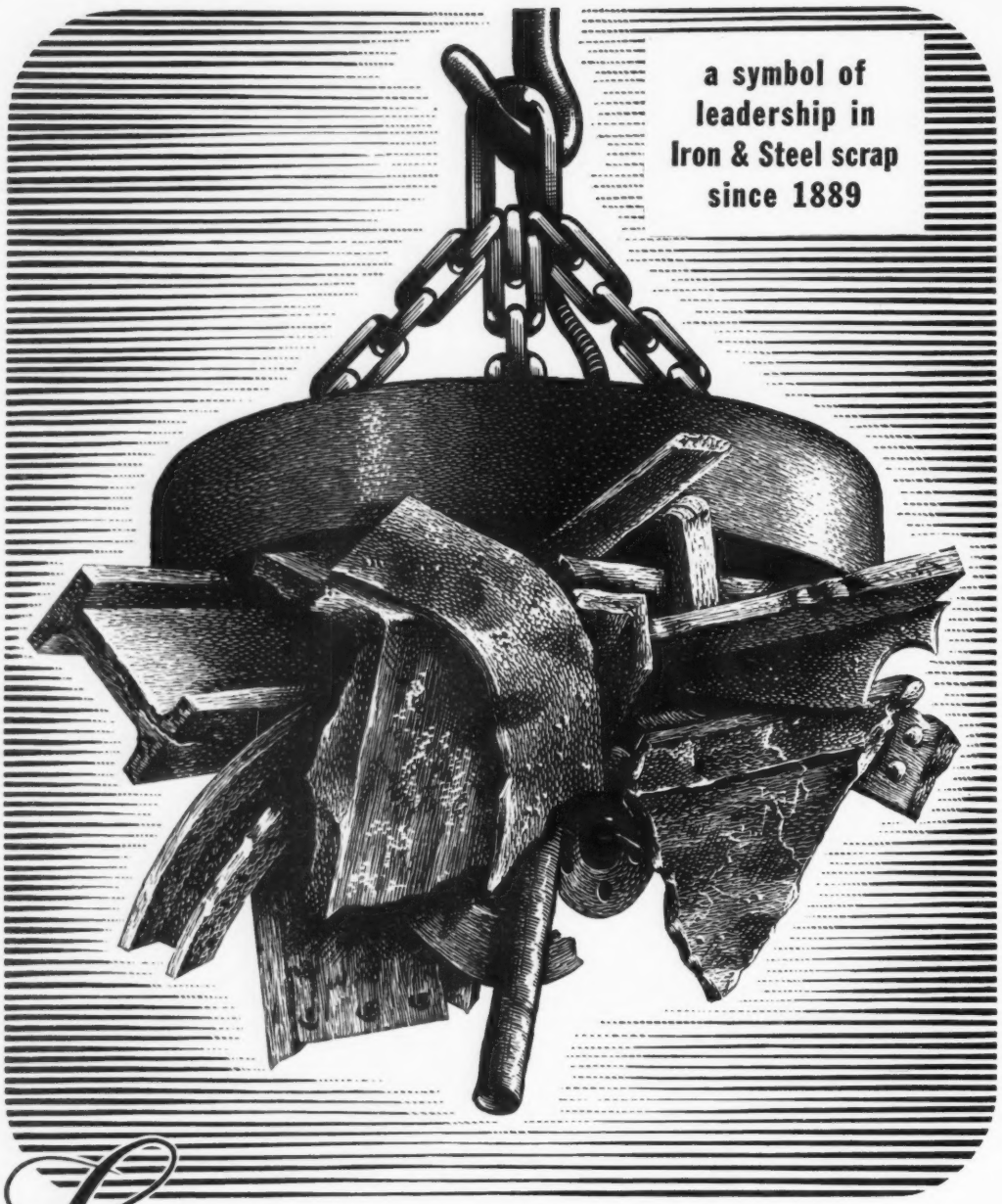

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Scrap Index Rises Despite Strike

STEEL's composite goes up 67 cents to $38.67 despite absence of active domestic demand. Immediate future price trend uncertain despite market support provided by heavy exports

Scrap Prices, Page 142

• **Philadelphia** — Reflecting continued strength in export demand, steel scrap prices are higher. No. 1 heavy melting is now quoted $40, delivered, No. 2 heavy melting $35, No. 1 bundles and No. 1 busheling $40-41, and electric furnace bundles $42. An exception to the uptrend in open hearth grades is No. 2 bundles, which are holding at $26-$28 delivered.

Heavy turnings are stronger at $34, delivered, low phos structurals and plate at $41-$43, and couplers, springs and wheels at $45. Heavy breakable cast is higher at $43-$45 in the cast iron grades.

• **New York**—Strong demand on export account has caused brokers to advance their buying prices on No. 1 heavy melting to $30-$31, No. 2 heavy melting to $27-$29, and No. 1 bundles to $30-$31. Prices on all other grades are unchanged.

• **Pittsburgh**—The only mills near Pittsburgh still operating are specialty producers and the Butler, Pa., plant of Armco Steel Corp. Trading is at a standstill on most grades, but demand for low phos material remains fairly strong. Before the walkout, dealers were encouraged by the upward movement of railroad scrap prices. July lists closed $1 to $2 higher than last month's. Prices may weaken during the first weeks of the strike, but dealers are counting on a strong recovery. They reason that the mills will fall behind on their ore receipts. When production resumes, they'll be more dependent on scrap.

• **Chicago**—The uncertainty as to the outcome of steel wage negotiations early last week served as an effective brake on scrap market activity. Mills which would be idled by a strike set a deadline for the intake of scrap and pretty well throttled the flow of material. Threatened mill idleness put a halt to a mild price rise stimulated by earlier optimism of agreement on a new contract. Demand for foundry grades has softened because many castings plants are closed for vacations.

• **Cleveland**—All Ohio steel plants were not struck and scrap is still moving in limited volume with shipments to the larger mills held up since July 8. Mills still operating in Ohio are: Detroit Steel Corp. at Portsmouth; Armco Steel Corp. at Middletown; Timken Roller Bearing Co. and Industrial Forge & Steel at Canton; Copperweld Steel Corp. at Warren; Weirton Steel Co. at Steubenville.

For the moment prices are unchanged, but the trend over coming weeks is uncertain. Brokers and dealers are expected to concentrate on foundry business, which, except for the vacation lull, has been good for some time.

• **Detroit**—Brokers and dealers are uncertain about the price trend now that the steel mills are struck. Some think quotations may decline, but none are willing to bet on it. There has been no buying the last week or so.

• **Buffalo**—Prices are higher, reflecting advances at other points, but no local mill is buying so a test of market strength is lacking. Dealers, however, have had to pay more for their supplies and would be unwilling to sell the mills at prevailing quotations. Recent strength in the market is expected to fade if the mills are strikebound for a long period.

• **Cincinnati**—Confidence that the scrap market would remain strong was evident right up to the steel strike deadline. Dealers and brokers were on the sidelines, however, awaiting developments. No new orders were received the last few days, and none is expected until the labor situation in the steel industry is clarified. Generation has slowed down seasonally, with many industrial plants closed for vacations. No. 1 heavy melting continues to be quoted by brokers at $35.50-$36.50.

• **St. Louis** — Local brokers and dealers are waiting to see what impact the steel strike will have on their market. Prices had been gradually moving upward, especially on railroad grades. Most railroad scrap is up $1 to $3 a ton, largely due to strengthening in the Chicago market and the fact consumers' stocks have been shrinking.

• **Houston**—Except for light export buying, no scrap is moving here. Shippers are working on Mexican

(*Please turn to Page* 147)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 15, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE SCRAP

July 15	$38.67
July 8	38.00
June Avg.	36.07
July 1958	37.54
July 1954	27.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	39.00-40.00
No. 2 heavy melting	34.00-35.00
No. 1 dealer bundles	*39.00-40.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*41.00-42.00*
No. 1 factory bundles	48.00-49.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals:	
2 ft and under	47.00-48.00
3 ft and under	46.00-47.00
Heavy turnings	*34.00-35.00*
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	*51.00-52.00*

Railroad Scrap

No. 1 R.R., heavy melt.	*46.00-47.00*
Rails, 2 ft and under	*58.00-59.00*
Rails, 18 in. and under	*58.00-59.00*
Random rails	*53.00-54.00*
Angles, splice bars	*53.00-54.00*
Railroad specialties	*53.00-54.00*
Rails rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	37.00-38.00
No. 1 hvy melt., dealer	35.00-36.00
No. 2 hvy melting	33.00-34.00
No. 1 factory bundles	41.00-42.00
No. 1 dealer bundles	36.00-37.00
No. 2 bundles	37.00-38.00
No. 1 busheling, indus.	36.00-37.00
No. 1 busheling, dealer	35.00-36.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals, 3 ft	45.00-46.00
Punchings & plate scrap	46.00-47.00

Cast Iron Grades

No. 1 cupola	52.00-53.00
Stove plate	49.00-50.00
Unstripped motor blocks	43.00-44.00
Clean auto cast	58.00-59.00
Drop broken machinery	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	50.00-51.00
Axles	59.00-60.00
Rails, rerolling	59.00-60.00

Stainless Steel Scrap

18-8 bundles & solids	*210.00-215.00*
18-8 turnings	*110.00-115.00*
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	41.00-42.00
No. 1 bundles	42.00-43.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	44.00-45.00
Electric furnace bundles	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00

CLEVELAND

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	38.00-39.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	46.00-47.00
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Brake shoes	36.00-37.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS
(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	*23.00*
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	54.00
Stove plate	46.50

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00*
Rails, 18 in. and under	50.00
Rails, random lengths	*44.00*
Rails, rerolling	*58.00*
Angles, splice bars	*48.00*

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	38.00-39.00
No. 2 bundles	*23.00-24.00*
No. 1 busheling	38.00-39.00
Cast iron borings	14.00-15.00
Machine shop turnings	*24.00-25.00*
Short shovel turnings	*27.00-28.00*
Bar crops and plates	44.00-45.00
Structurals & plates	43.00-44.00
Electric furnace bundles	38.00-39.00
Electric furnace:	
3 ft and under	37.00-38.00
2 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	55.00-56.00
Stove plate	55.00-56.00
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	*50.00-51.00*
Rails, rerolling	*56.00-57.00*
Rails, random lengths	*44.00-45.00*
Angles, splice bars	*45.00-46.00*

PHILADELPHIA

No. 1 heavy melting	*40.00*
No. 2 heavy melting	*35.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*26.00-28.00*
No. 1 busheling	*40.00-41.00*
Electric furnace bundles	*42.00*
Mixed borings, turnings	20.00†
Short shovel turnings	24.00-25.00
Machine shop turnings	20.00
Heavy turnings	*34.00*
Structurals & plate	*41.00-43.00*
Couplers, springs, wheels	*45.00*
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	*43.00-45.00*
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK
(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.00-29.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	19.00-20.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-43.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Railr, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	21.00-22.00
Cast iron borings	20.00-21.00
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	42.00-43.00
Charging box cast	39.00-40.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	40.00-41.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	47.00-48.00

HOUSTON
(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	21.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Heavy breakable	*26.50*
Foundry malleable	*42.00-43.00*
Unstripped motor blocks	*38.50-39.50*

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-20.50
No. 1 bundles	26.00-27.00
No. 1 busheling	26.00-27.00
Machine shop turnings	10.00-11.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT
(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	36.00-37.00
No. 2 bundles	21.00-22.00
No. 1 busheling	34.00-35.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	39.00-40.00
Heavy breakable	40.00-41.00
Unstripped motor blocks	29.00-30.00
Charging box cast	40.00-41.00
Clean auto cast	52.00-53.00

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	39.50
No. 2 heavy melting	37.50
No. 1 bundles	37.50
No. 2 bundles	20.00
Machine shop turnings	18.50
Shoveling turnings	20.50
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	50.50

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	48.50

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

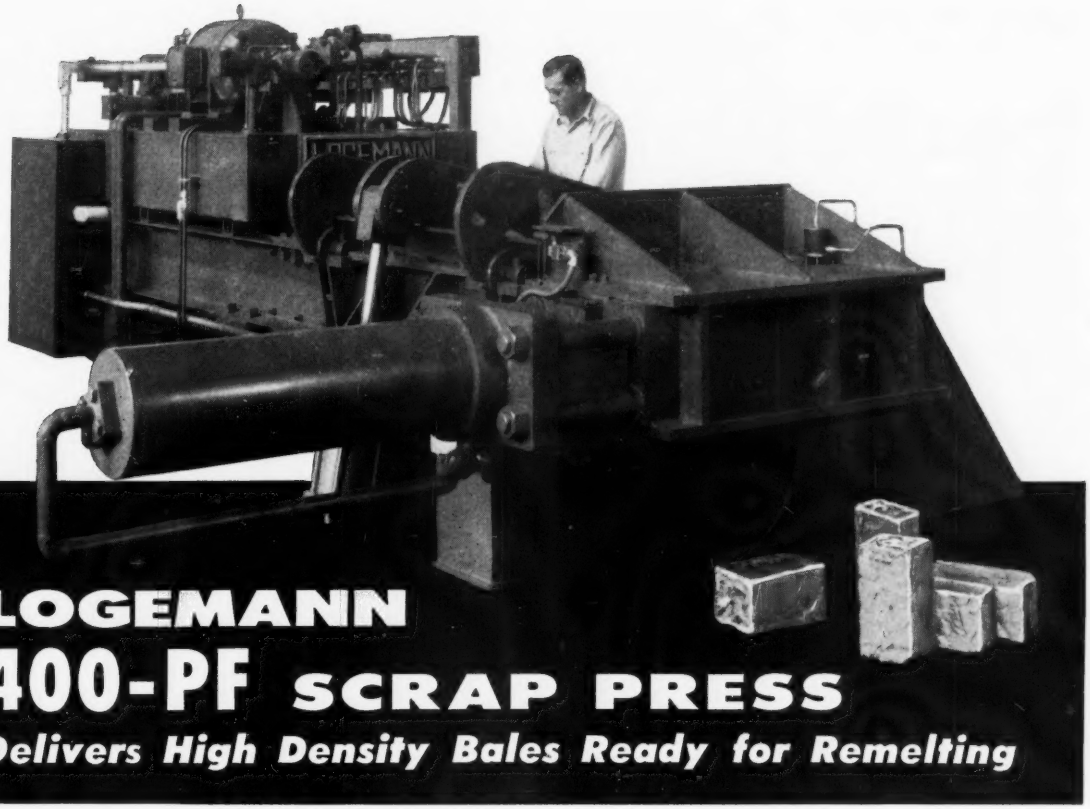
HAMILTON, ONT.
(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.



LOGEMANN 400-PF SCRAP PRESS

Delivers High Density Bales Ready for Remelting

▶ Designed Specifically for Pressing:

☆ COPPER ☆ BRASS ☆ ALUMINUM

☆ STAINLESS STEEL AND BLACK STEEL SCRAP

☆ WIRE ☆ COILS ☆ SKELETONS

☆ CONTAINERS ☆ UTENSILS

HERE ARE THE FEATURES YOU WANT

Top-loading by means of a filling-hopper which can be charged at floor level; a tamper-cover to crush down bulky scrap into the press-box; a charging plate arrangement that permits the hopper to dump a load of scrap into the press while a bale is being made, thus speeding up the production; and the positive discharge of the bale from the bottom. Bottom discharge insures cleaning of the box with each bale, avoiding contamination of bales by foreign matter that might otherwise remain in the press-box.

OPERATION IS ENTIRELY HYDRAULIC

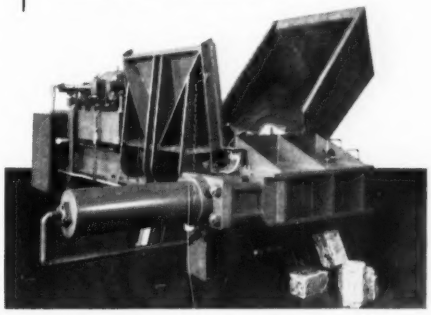
Special valves are controlled by electric switches and relays. To retain flexibility, the hopper and tamper-cover are independently controlled; pressing and bale discharge are automatic, though manual control is also available, when desired.

SPECIFICATIONS

Press-box is 72 inches long, 36 inches wide and 12 inches deep, and the loading area is 60 inches by 36 inches. Bales are 12 inches high, width can be optionally 7, 6, 5 or 4 inches, length varies depending on the character and quantity of scrap charged, which also determines the bale weights. High density is attained through use of powerful hydraulic rams.

OUTPUT

Hourly output is determined by speed of loading. Press operates at high speed; three charges can be in process simultaneously — one in the filling hopper, another on the charging plate, a third under compression.



When writing for complete details, please state the quantity and character of scrap to be baled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Brass Mills Update Extras

Industry revises tube and sheet schedules for first time in over 20 years. Net result: Over half the products will cost less. Look for changes in other items

Nonferrous Metal Prices, Pages 146 & 147

A REVOLUTION of sorts is going on in the copper and brass mill industry.

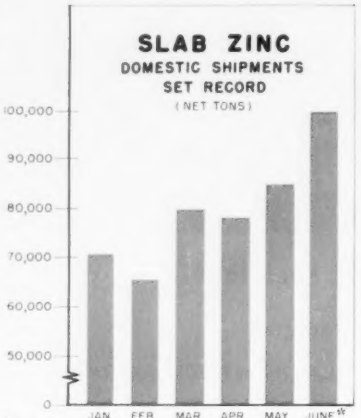
Price extras, which haven't been revised in well over 20 years, are being modernized. Result: Some products will cost less, some more. But almost more importantly, net prices will be easier to figure, and they will be a truer reflection of the actual cost of the products than the industry has seen for years. (Base prices are unchanged.)

By now, most members of the industry are on the new price schedule or have it under advisement. Several have told STEEL they must adopt it to remain competitive. The movement started several weeks ago when American Brass Co. brought out a new extra list for seamless tubes. Then Revere Copper & Brass Inc. announced on June 29 that it was making revisions in its sheet lists. The rest of the industry followed on tubes, and it is a safe bet they'll do likewise on sheets.

• **What It Means**—The old schedules were worked out in the early 1930s under the National Industrial Recovery Act. When they were set up, the standard discount was 30 to 35 per cent. As materials and labor became more expensive, and as technology and mill practices changed, the discount dwindled to zero and additions became the rule. When the new schedules were announced, additions of 120 per cent were common, and figuring the net was more complicated than a Chinese crossword puzzle.

The new lists reflect all those changes, and once again the discount is back—about 45 per cent for sheets and 50 per cent for tubes. Price men say that a little over half the products end up with a net lower than under the old setup. But that doesn't mean that your metals bill will necessarily be lower. Some of the prices went up, and your product requirements will determine whether you gain or lose.

• **Take Your Choice**—Most of the schedules are in effect now, but you have a choice in some cases. Revere's new prices will not become compulsory until Aug. 15. Until then, you have your choice of the new or old price, whichever is to your advantage. Other producers simply comment that they will remain competitive in all products.



* Includes approximately 9000 tons shipped on consignment
Source: American Zinc Institute Inc.

Brass mill officials say that they have considered this move for several years. Additions and minor revisions to the old schedules have been so complicated that, as one price man said: "You have to have a Ph. D. in higher math to figure out the net price."

• **Side Benefit**—One of the auxiliary benefits to the mills themselves is the up to date knowledge they have of their costs. One industry official said: "We have always had a fair idea, but the complete cost analysis involved in this change has revealed some important things. For instance, now we know that it costs more to make a specific product in one mill than in another. This will help us to decide to either modernize the equipment in the less efficient plant or equalize costs in some other way."

While only tubes and sheets are involved so far, several officials feel that the modernization eventually will spread to all products. But no timetable has been set up as far as STEEL can learn.

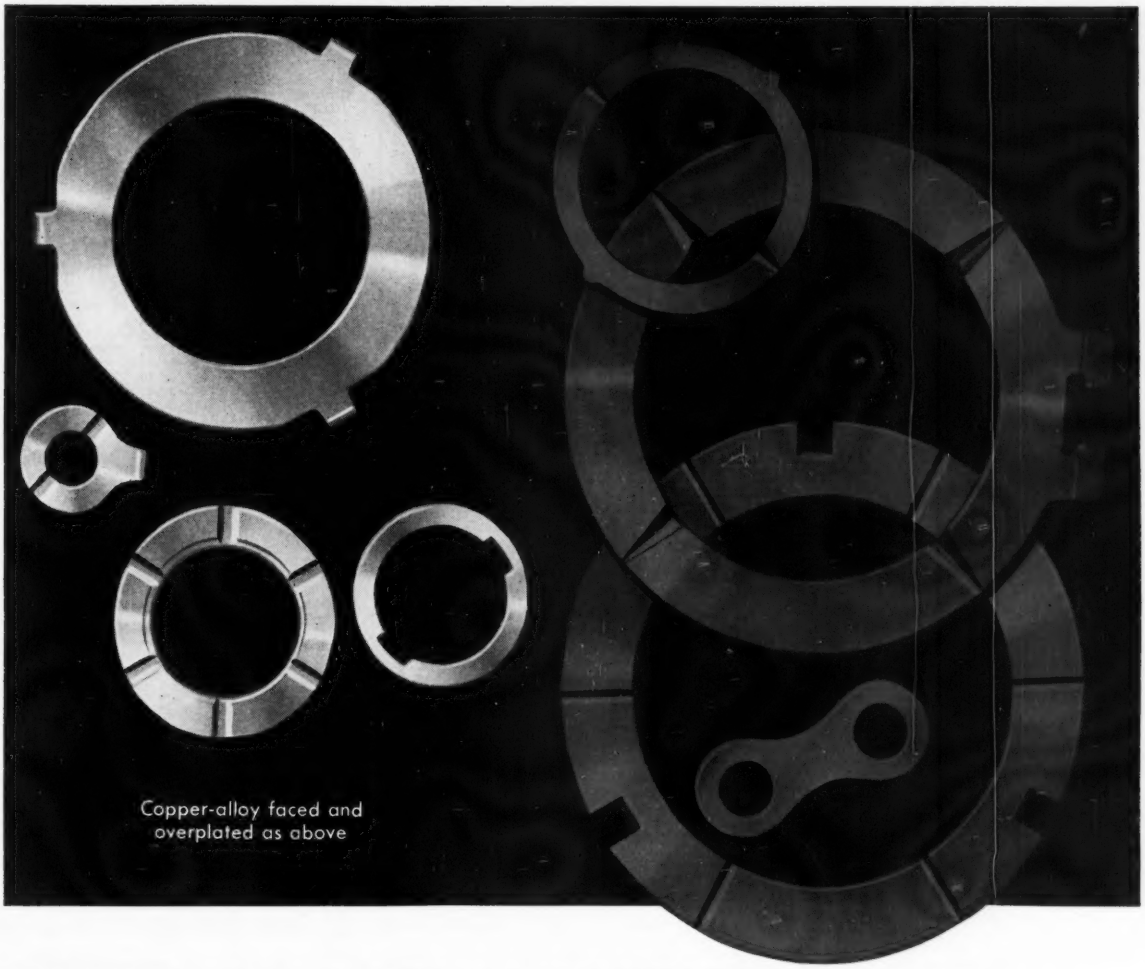
Copper Price, Output Cut

Primary copper producers closed the wide gap between their price and that of custom smelters by cutting back 1.5 cent to 30 cents a pound on July 14. The day before custom smelters had chopped off another 0.5 cent to 29 cents a pound. At the same time, Phelps Dodge Corp. announced a second half cutback in production of 7 per cent.

NONFERROUS PRICE RECORD

	July 15 Price	Last Change	Previous Price	June Avg	May Avg	July, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	29.00-30.00	July 14, 1959	29.00-31.50	31.490	31.750	26.125
Lead	11.80	May 7, 1959	11.30	11.800	11.700	10.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.25	July 14, 1959	102.625	104.284	103.080	94.950
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.



PRECISION THRUST WASHERS

Variety in design and material

Uniformity in quality and performance

In solid bronze, or steel faced with lead or tin-base babbitt, or sintered copper-alloy or bronze on one or both faces. They are cold rolled for heavy-duty operation. Flat, spherical or special shapes, with coined oil grooves, ball indentations on one or both sides, holes, nibs, lugs or scallops. Up to 5″ O.D. Extensive manufacturing facilities. Quality control. Complete engineering service.

FREE!

New Thrust Washer Design Guide

Just off the press! A helpful design guide, compiled by our engineering department. Write for your free copy—today!

FEDERAL-MOGUL DIVISION

FEDERAL-MOGUL-BOWER BEARINGS, INC., 11051 SHOEMAKER, DETROIT 13, MICHIGAN

Copper-Alloy Lined Bearings

Spacer Tubes

Camshaft Bearings

Aluminum or Babbitt Lined Bearings

FEDERAL Mogul
SINCE 1899

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 30.00 deld.; custom smelters, 29.00; lake, 30.00 deld.; fire refined, 29.75 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $238-240 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., $9.85 per lb in lots of 2500 lb or more, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 198 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb: nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 35.355; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 22.00-22.50; No. 2 heavy copper and wire, 20.00-20.50; light copper, 18.00-18.50; No. 1 composition red brass, 17.00-17.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	54.13b	51.36c	....	54.32
Yellow Brass	47.24	31.81d	47.78	50.65
Low Brass, 80%	50.03	47.97	50.57	53.34
Red Brass, 85%	51.02	50.96	51.56	54.33
Com. Bronze, 90%	52.55	52.49	53.09	55.61
Manganese Bronze	55.61	49.30	59.74	....
Muntz Metal	49.95	45.26	....	....
Naval Brass	51.90	45.71	58.46	55.31
Silicon Bronze	59.23	58.42	58.77	76.91
Nickel Silver, 10%	62.85	65.18	65.18	....
Phos. Bronze	73.92	74.42	74.42	75.60

SCRAP ALLOWANCES e (Based on copper at 30.00c)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	26.000	26.000	25.250
Yellow Brass	19.625	18.750	17.750
Low Brass, 80%	22.000	21.750	21.250
Red Brass, 85%	22.875	22.625	22.125
Com. Bronze, 90%	23.875	23.625	23.125
Manganese Bronze	18.375	18.125	17.500
Muntz Metal	18.375	18.125	17.625
Naval Brass	18.250	18.000	17.500
Silicon Bronze	25.500	25.250	24.500
Nickel Silver, 10%	24.500	24.250	12.250
Phos. Bronze	27.125	26.875	25.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.00-16.50; new brass clippings, 15.00-15.50; light brass, 10.50-11.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.50-13.00; auto radiators, unsweated, 13.25-13.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.50-3.00; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.-00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-12.00; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 23.125; light copper, 20.875; refinery brass (60% copper) dry copper content, 23.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 23.125; light copper, 20.875; No. 1 composition borings, 19.50; No. 1 composition solids, 20.00; heavy yellow brass solids, 14.25; yellow brass turnings, 13.25; radiators, 15.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 46.29; oval, 44.50, 5000-10,000 lb; electrodeposited, 36.00, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,000 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.

Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.

Stannous Sulphate: Less than 50 lb, 140.20; 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 141)

sales. A Monterrey mill jumped its buying prices $5 a ton on a new order. Brokers are offering shippers $41 for No. 1 heavy melting and $38 for No. 2 heavy melting, delivered at the border.

Light export buying continues. Representative prices are: $37 for No. 1 heavy melting, $34 for No. 2 heavy melting, and $23 for No. 2 bundles, f.a.s.

The over-the-scale movement of tonnage is slow.

The cast iron scrap market is strong. Houston brokers increased their quotations $1 a ton on new sales to East Texas foundries. Cast is in short supply.

• **Birmingham** — All first-of-the-month orders, which carried a July 14 delivery deadline, have been filled. One electric furnace has released shipments held up a couple weeks ago, and another, which had a deadline delivery date of July 15 though not affected by the steel wage dispute, is expected to buy this week. Foundry steel is hard to find, and small-size automotive scrap is in demand.

• **San Francisco**—Steel scrap prices are unchanged, but there have been some export sales at $1 to $2 a ton above quoted levels. In addition to heavy purchases of local scrap, Japan has contracted for seven old vessels to be broken up. Five Liberty ships and the baby aircraft carrier *Windham Bay* will be towed to Japan. The battleship *Colorado* will be broken up in an American yard.

Pig Iron . . .

Pig Iron Prices, Page 135

No early stringency in supply of pig iron is expected, although many merchant furnaces have been forced down by the strike. Certain domestic furnaces can be called upon for limited tonnages.

Foundries have fair inventories on hand and are reducing melts as a result of closedowns for vacations. Another ameliorative factor is the amount of foreign iron being offered from stockpiles in this country.

Demand for iron is expected to start picking up in the latter part of July, hitting an even better clip in August. If blast furnaces have not resumed normal operations by that time, a shortage likely will develop.

Dominion Foundries Plans New Galvanizing Line

Dominion Foundries & Steel Ltd., Hamilton, Ont., is planning installation of a second continuous coating line. It'll coat sheet steel with zinc, aluminum, and other coating metals. Also, says Frank H. Sherman, president, greater need for steel will speed the day when the company will build a second blast furnace and add a sintering plant.

The new coating line, to be installed next year, will parallel the present line.

Distributors . . .

Prices, Page 135

Steel service centers not strike bound are well stocked to help customers fill in their needs during the strike period. Only a prolonged shutdown of the mills would put a

CLASSIFIED

FOR SALE LESS THAN MILL PRICE
NEW PLATE

90 tons 5/16 x 18 x 72 nickel chrome moly SAE 8630 annealed, P. & O. on skids.

BARKSDALE MFG. CO.
Blytheville, Ark.

STEEL PRODUCTS SALES MANAGER

Small plant Dallas area desires sales manager with excellent acquaintanceship among reinforcing bar and building material firms.

Sales ability is of primary importance but administrative duties also included. Salary $10,000 range with bonus incentive would realize annual income of upwards $20,000.

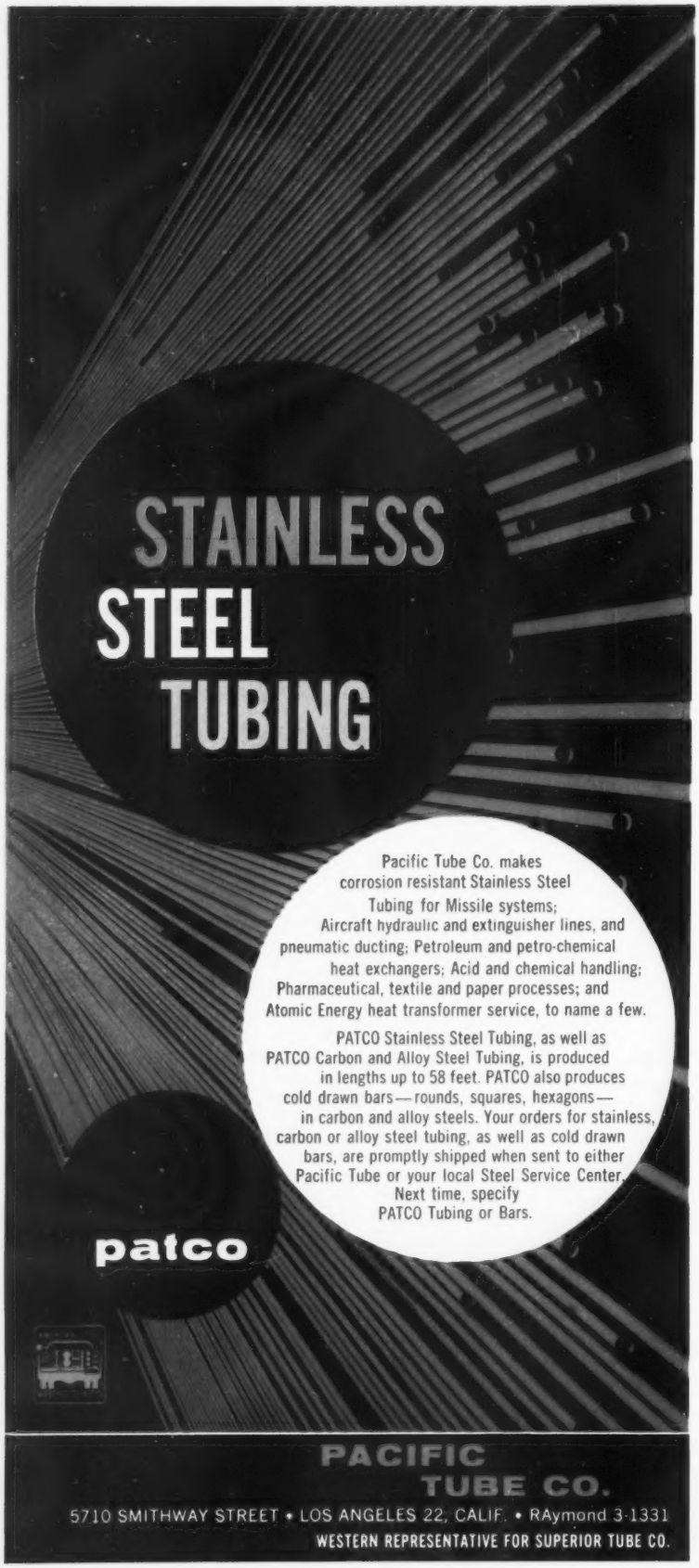
We want aggressive man who wants to grow with a young company and create a substantial future for himself.

Reply Box 778, STEEL
Penton Bldg. Cleveland 13, Ohio

Positions Wanted

CHIEF ESTIMATOR—Sixteen years experience steel plate, pressure vessel and machinery fabrication. Write Box 776, STEEL, Penton Bldg., Cleveland 13, Ohio.

POSITION WANTED: With efficient and aggressive Ornamental Iron, Aluminum and Stainless Steel Fabricator requiring the services of a top grade man capable of assuming complete charge of engineering and estimating and the coordinating of various departments. Very good draftsman and engineer with very broad experience in complicated work. Age 49 years, neat appearance, good health, and very good references. Could be available within sixty days. Reply Box 777, STEEL, Penton Bldg., Cleveland 13, Ohio.


STAINLESS
STEEL
TUBING
Pacific Tube Co. makes corrosion resistant Stainless Steel Tubing for Missile systems; Aircraft hydraulic and extinguisher lines, and pneumatic ducting; Petroleum and petro-chemical heat exchangers; Acid and chemical handling; Pharmaceutical, textile and paper processes; and Atomic Energy heat transformer service, to name a few.
PATCO Stainless Steel Tubing, as well as PATCO Carbon and Alloy Steel Tubing, is produced in lengths up to 58 feet. PATCO also produces cold drawn bars—rounds, squares, hexagons—in carbon and alloy steels. Your orders for stainless, carbon or alloy steel tubing, as well as cold drawn bars, are promptly shipped when sent to either Pacific Tube or your local Steel Service Center. Next time, specify PATCO Tubing or Bars.
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PACIFIC
TUBE CO.
5710 SMITHWAY STREET • LOS ANGELES 22, CALIF. • RAymond 3-1331
WESTERN REPRESENTATIVE FOR SUPERIOR TUBE CO.

serious pinch on steel supplies for most users.

Distributors look for some improvement in bookings this month, although many metalworking shops will be closed for mass vacations. The loss of tonnage to these consumers will be more than equaled by gains to plants which ordinarily would cover their needs through mill sources.

Demand from fabricators, machine shops, refineries, and chemical plants in the Southwest continues strong, but a large portion is being diverted to foreign mill depots and imported steel brokers. One distributor in the Houston district believes only a prolonged strike will bring the market into balance.

Earle M. Jorgensen Co. will increase its warehouse space in Oakland, Calif., by 70 per cent to accommodate enlarged inventories and additional cutting and handling facilities. The company also plans to open additional plants in Seattle, Denver, and Phoenix, Ariz., this fall.

Tubular Goods . . .

Tubular Goods Prices, Page 134

Although shipments of oil country goods have been stepped up to maximum, tubemakers probably won't deliver as much tonnage this month as they did in June. Up to the midmonth strike deadline, July shipments were behind those last month. June demand was particularly strong because of a run on downriver stocks.

Even if only a short strike is experienced, it's expected operations will drop sharply from the current level (close to capacity) to around 50 per cent.

Barring a prolonged strike, the third quarter outlook for standard pipe is relatively good. Operations may average 60 to 65 per cent of capacity. Producers won't have to wait for their customers to work off excessive inventories.

Line pipe is sold out through September, but the mills have plenty of tonnage open in fourth quarter schedules.

Rotary drilling in the U. S. resumed an upward trend during the week ended July 6. Hughes Tool Co.'s survey showed 2248 rigs at work, nine more than in the previous week, and 454 more than in the like week a year ago.

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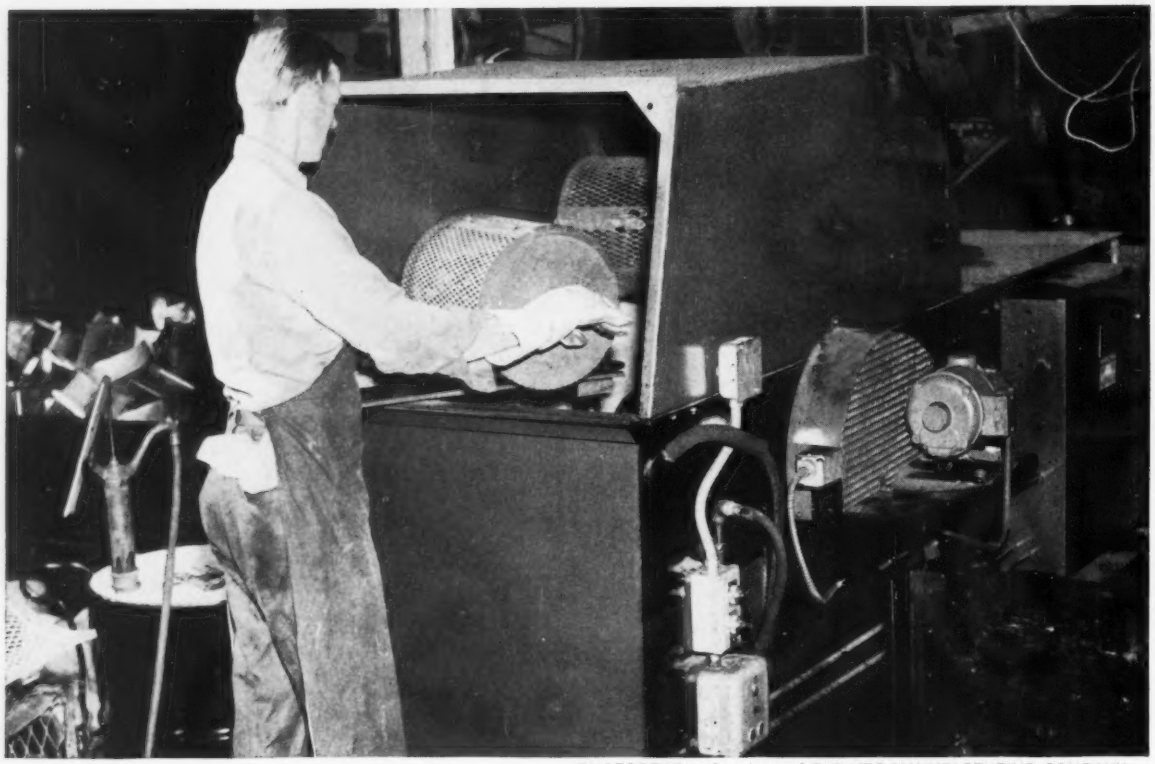
TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly

Vapor degreasing-

we can show you how to save more money, get better cleaning results with the right degreasing cycle



PHOTOGRAPH: Courtesy of PHILLIPS MANUFACTURING COMPANY

The new Phillips Rotomatic with liquid dip permits strict control of cleaning cycles. In addition the back end of the tank, above the boiling sump, can be used as a straight batch-type degreaser.

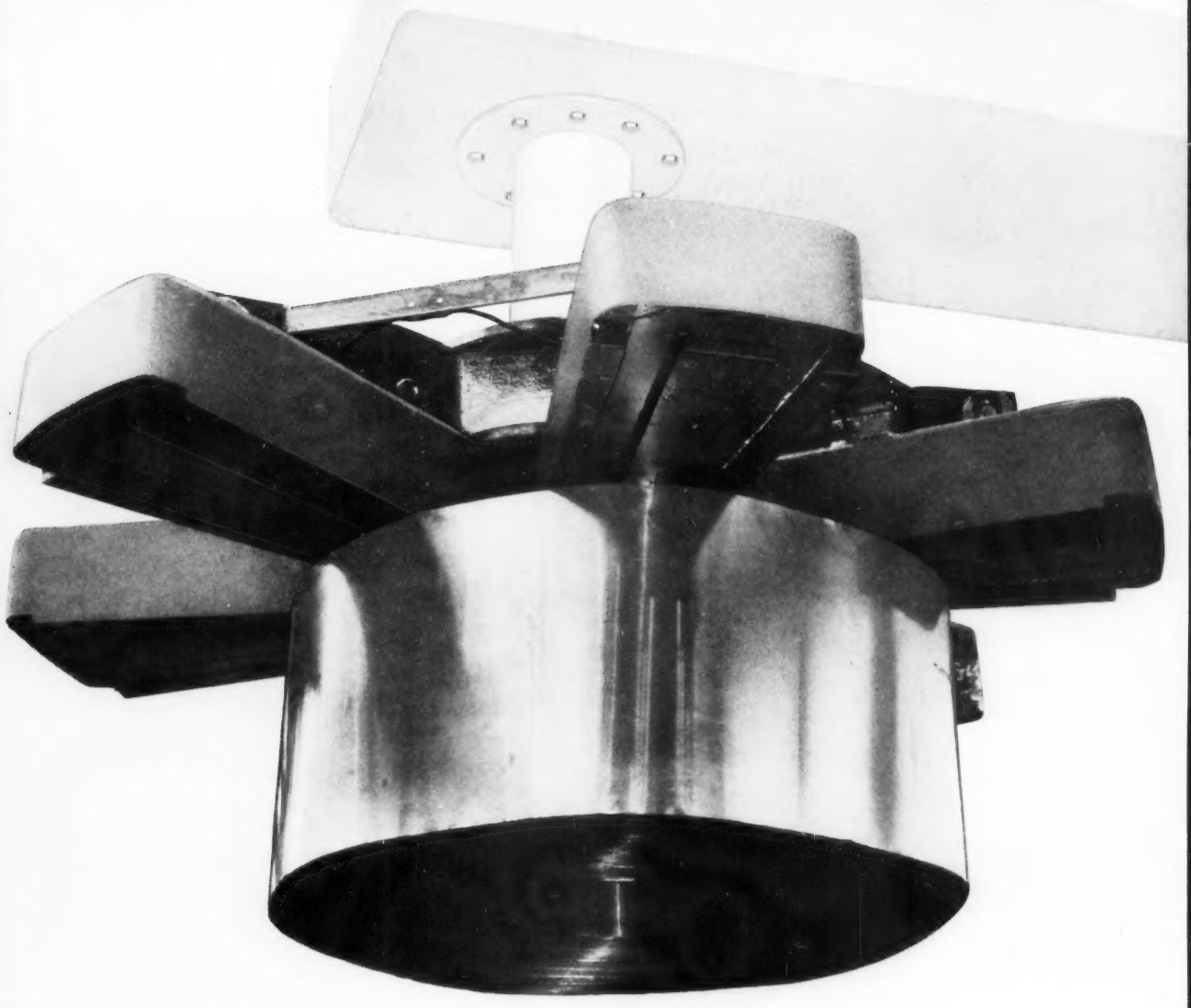
Vapor degreasing with Diamond Perchlorethylene digs out soils other methods can't touch. Handles all part sizes and weights. Requires less space, effort and maintenance. It's safe, fast, flexible . . . and work comes out stain-free, etch-free, warm and dry.

But *your* cleaning operation calls for its own degreasing cycle. And that's where DIAMOND PERCHLORETHYLENE comes in.

We'll test-clean a sample for you! Diamond Solvent Specialists will analyze your cleaning problems and help you select the sample for test cleaning. Then they'll give you a full report on the cycle that's most efficient for you and saves you the most money.

So ask for DIAMOND TECHNICAL SERVICE *now*. For information, write DIAMOND ALKALI CO., 300 Union Commerce Bldg., Cleveland 14, O.

Diamond Chemicals



Annealing's biggest attraction!

The largest coil lifting magnet ever built helps make possible the finest annealing system ever devised.

This huge magnet was designed as a part of the revolutionary new Lee Wilson Opened Coil Annealing System. It will pick up a 40,000 lb., 114 inch "opened" coil of tin plate without edge damage or distorting opened laminations.

The magnet will handle coils in process in this new system where steel coils are "opened" with an air space between each winding, permitting hot gases to reach the entire surface of the coil simultaneously, resulting in the fastest, most uniform annealing possible.

Three of North America's leading steel producers have already placed their orders for this amazing new system. Literature on request.

Lee Wilson* **ENGINEERING COMPANY, INC.**

20005 LAKE ROAD • CLEVELAND 16, OHIO

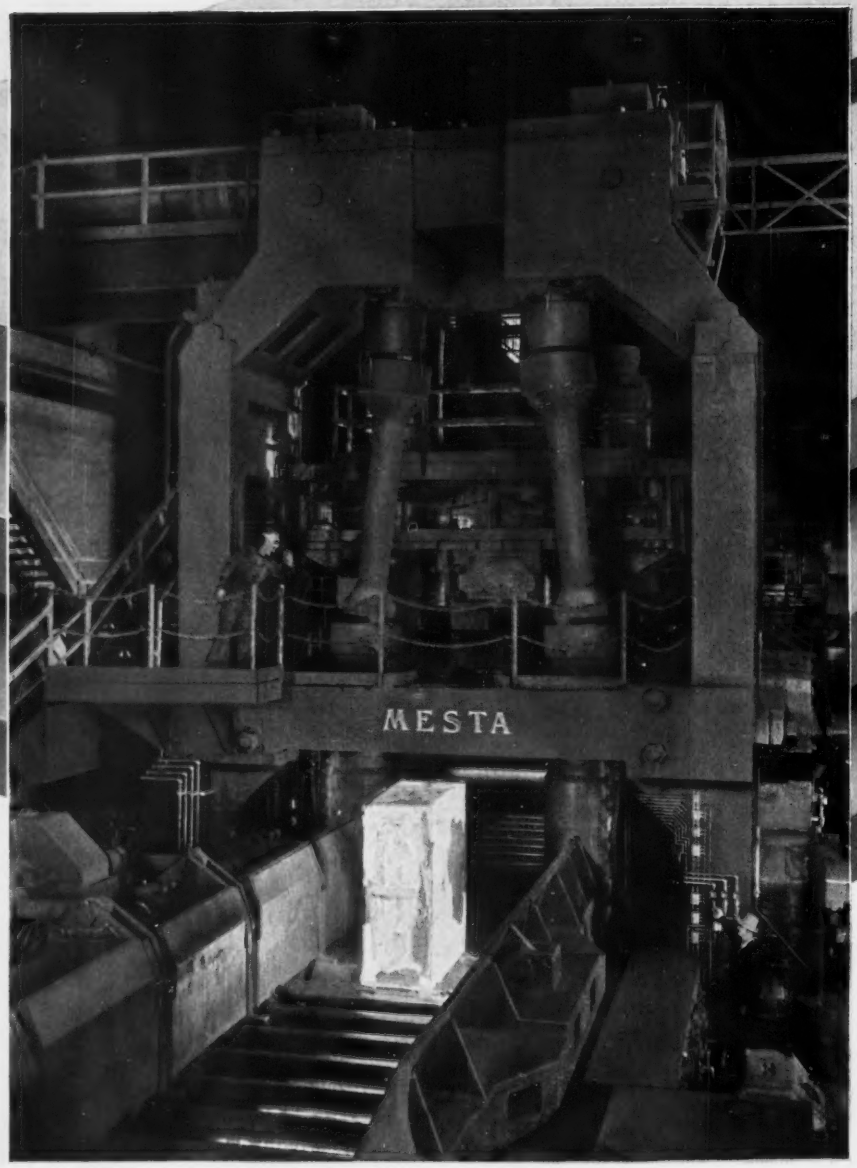
HIGH PRODUCTION ANNEALING SYSTEMS

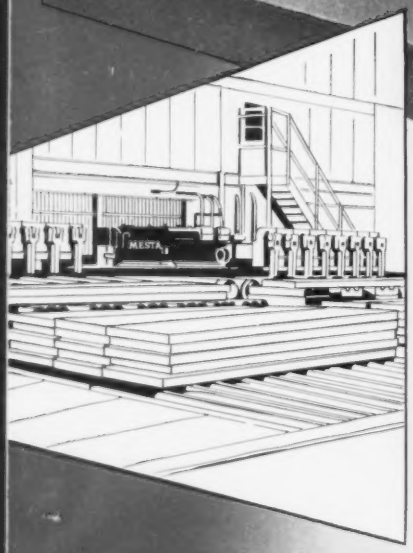
MAKE THE BEST METALS BETTER

* ORIGINATORS AND LEADING PRODUCERS OF OPENED COIL AND SINGLE STACK FURNACES

SLABBING MILLS

Designed and Built by MESTA





Rolling 20 Ton Ingots into Slabs on a Mesta
45" x 90" Universal Reversing Slabbing Mill

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

MESTA
THERE IS NONE BETTER